CAA
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Fiscal Year 1997

DECEMBER 1997

US ARMY CONCEPTS ANALYSIS AGENCY
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CAA
CONCEPTS ANALYSIS AGENCY

FY97 ANNUAL REPORT

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REPLY TO
ATTENTION OF:

CSCA-MSP (5-5d)

04 FEB 1998

MEMORANDUM FOR RECORD

SUBJECT: United States Army Concepts Analysis Agency FY97 Annual Report

This year's accomplishments, although as diverse as ever, were dominated by a steady flow of workload spawned by the Quadrennial Defense Review (QDR). Now that we have the QDR behind us, it seems that there will be a steady flow of related future force evaluation studies, some with markedly different organizational concepts and functions from the Army of today. So with the QDR and other future force planning studies as the theme, I welcome you to read our account of FY97 and what possibly lies ahead in the future.

E. B. VANDIVER III
Director

Encl

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INTRODUCTION AND OVERVIEW

GENERAL

Report Purpose. The Fiscal Year 1997 (FY97) Annual Report profiles the US Army Concepts Analysis Agency (CAA), highlights key elements of FY97 mission performance, presents the current posture of the Agency, describes CAA's direction for the near-term future, and serves as the historical record of FY97 Agency activities.

Report Organization. This report is organized into seven major components starting with **Chapter 1** which provides a snapshot of what happened last year; and secondarily, provides insights as to how CAA is positioned to meet the challenges of the future. **Chapter 2** highlights major studies, chief among them being those which contributed to the Quadrennial Defense Review (QDR) and related future force planning. **Chapter 3** is the total package of analytical summaries completed during FY97. **Chapter 4** contains a summary of CAA's technological resources and profiles how we are positioned to meet future workloads. **Chapter 5** is a report of stewardship of CAA's personnel and financial resources in a year when personnel resources finally stabilized after eight years of steady decline. A five year workload history is at **Chapter 6,** followed by several **appendices.**

CAA ORIGIN, ORGANIZATION, MISSION, PRODUCTS, AND SPONSORS

Origin. CAA was formed as a result of the 1973 STEADFAST Army reorganization which combined missions, functions, and elements of the former Combat Developments Command (CDC) and the Strategy and Tactics Analysis Group (STAG), Figure 1-1. CAA was created to function as the central force analysis activity for the Department of the Army and its leadership.

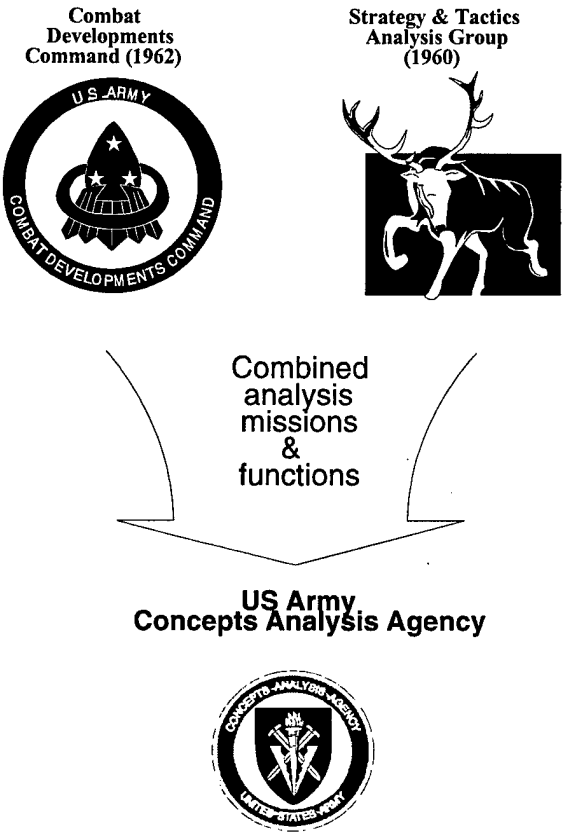


Figure 1-1. CAA History

Figure 1-2. CAA Organization Chart

CAA Organization.

◆ CAA has evolved over the years to its current organizational structure as a field operating agency (FOA) of Headquarters, Department of the Army (HQDA). While the primary role of CAA remains to support HQDA and Army leadership, its analytic activities have expanded to encompass a wide range of analytical services performed in support of virtually all Army elements, and occasionally other Department of Defense (DOD) and US government agencies.

◆ CAA's organization is headed by the Office of the Director which includes the Chief of Staff and Technical Director who along with the Director oversee ten Analysis Divisions, (two of which are special elements performing Operational Capability Assessments - Northeast Asia and Southwest Asia) and three support divisions.

Mission. Within the Army's overall analytical framework (Figure 1-3), CAA is designated as The Army's Center for Strategy and Force Evaluation. CAA is assigned the primary mission of assessing strategies, strategic concepts, broad military options, resource allocation alternatives, and analyzing Army force level capabilities and requirements in the context of joint and combined forces.

◆ CAA analyses are to assist the Chief of Staff, Army to evaluate, plan, and execute the Army's strategic force mission; assess alternative resource applications; and determine requirements and establish objectives for joint and combined theater, regional, low-intensity, and contingency forces.

◆ CAA force analyses focus on integrating scenarios, operating concepts and objectives, unit and materiel performance characteristics, and the operating parameters of the regions for which forces are constituted. These analyses form the baseline for lower level forces and systems analyses. Since the end of the Cold War, and the onset of international instability CAA's mission has taken on new meanings.

By law all "forces" must be assigned to a Commander in Chief of a Unified or Specified Command. All forces, during war, operate under a Commander in Chief in a theater of operations. A theater is defined as that area of conflict necessary for military operations pursuant to an assigned mission. It has specified geographical limits established by the National Command Authority. Understanding the fighting Army then begins with an understanding of the organization and structure of the forces assigned to a Commander in Chief in a theater. As the Army's center for strategy and force evaluation, it is CAA's mission to employ this understanding in ways that allow us to project force organization and structure requirements into the early years of the 21st Century.

The Army organizes forces in a theater(s) in accordance with functional, hierarchical and historical imperatives. Doctrine stipulates that all forces belong to either a division, a corps, or a theater army. CAA's mission is to analyze the latter. However, in the QDR our analysis reached down into alternative systems modernization at the corps level. At any level, the purpose remains the same- to analyze and sometimes recommend alternative force structures to carry out the tenets of the National Military Strategy

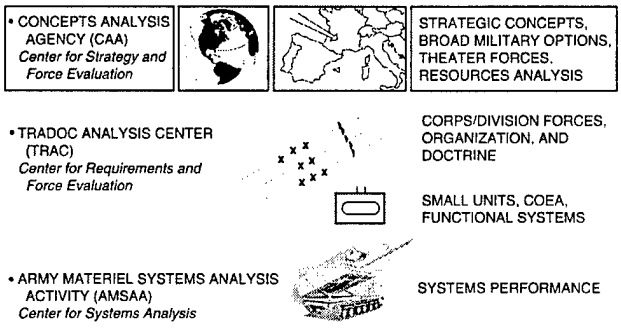


Figure 1-3. CAA Mission Within the Army Analytical Framework

As in most fiscal years, except for those that are dominated by an operational contingency, CAA spent considerable time evaluating the Army's long term force requirements given various Major Theater War (MTW) scenarios, Smaller Scale Contingencies (SSCs), and realistic resource estimates with which to counter and defeat them. What sets this year apart from others is the political impetus behind these reviews, and the long term impact that decisions coming from these analyses could have on the size and composition of the US Army for many years to come.

The Quadrennial Defense Review (QDR)

The theater Army has both operational and support responsibilities. The Defense Planning Guidance defines the operational forces in terms of divisions. The Total Army Analysis (TAA) process adds the support forces required to sustain the operational forces. CAA's analytical support to HQDA participation in the Quadrennial Defense Review took advantage of recently completed and ongoing studies relating to, and bearing on, the QDR purpose and objectives. We did so by adapting methods, models, and processes coming from these studies to the problems posed by the QDR. In some cases we were required to define new contingencies and develop new models to answer HQDA questions. Along the way we enhanced the QDR - spawned Objective Force Planning (OFP) process to the point where it is under consideration as a 'permanent' automated force planning tool within the Total Army Analysis process.

What Was The Quadrennial Defense Review?

The QDR was the latest in a series of efforts, following the end of the Cold War, to quantify defense requirements in support of the National Security Strategy. The two most prominent of these reviews were the Bottom Up Review (BUR), and the Quadrennial Defense Review. The essence of these types of reviews is often lost on those not directly involved in the analysis or a similar type analysis sometime in the past. These reviews are all similar in their basic approach in that they resemble macro reviews of resource requirements. The scale of these reviews renders them complex in that the resources on hand are like a ball of string that requires unraveling prior to analysis. If successful in the first step, subsequent steps can range from worthless to valuable given the leadership guidance, insight of the reviewers, and the various tools they bring to the table. In the case of this generation of macro-resource review studies one of the essential tools has proven to be the US Army Concepts Analysis Agency.

The common string that typically runs through these type of studies is the method used i.e., 'bottom-up review.' This is a time honored term that is sometimes characterized as starting with a 'blank sheet of paper,' meaning that the review theoretically starts with no existing resources, sacred missions, or anything else that would cloud an objective assessment. Consideration is given to the functions needing to be performed, by which organization, by how many people, and by whatever means are necessary to complete the mission.

In the case of national defense, pre-empting or defeating any threat to our nation is the mission; a workload not easily measured. A natural tendency when faced with this dilemma is to break the mission into smaller chunks of work, using tools that are well-fitted to the task(s) at hand and that will allow timely performance. Smaller units/increments of measure are more supportable in that they impart a level of understanding required to get the job done and to instill confidence in the ultimate decision-makers. This is the point in the process that CAA support proves most valuable. Going back to last year's annual report, the importance of staying 'in-the-loop' was emphasized. The QDR drove this point home.

The smaller units of measure referred to in the previous paragraph are often created and calibrated at CAA. In the example of the QDR, CAA broke this effort into several major analyses which had their foundations in earlier CAA studies. The following titles do not represent all of the work that went into the QDR, but were the names given by the Agency when breaking this rather large effort into manageable increments of work. They were:

- The Quadrennial Defense Review (QDR)
- The Objective Force Planning Process (OFP) -The Ground Maneuver Joint Warfare Capabilities Assessment (GMAS)
- Total Army Analysis - 2005 (TAA-05)
- Deep Attack Weapons Mix Study (DAWMS)

All but TAA had their beginnings in some OSD initiative; beginnings which differed in the stage of development at which CAA's support was enlisted.

The ***QDR*** effort explored a number of evolutionary options for future force development including equipment modernization alternatives; impact of small scale contingencies on preparation for major theater war(s) given Army force closure objectives; and a host of force assessment alternatives in the context of OSD alternatives, CINC OPLANS, and extended program objective memoranda. The CAA-QDR study was just one component of the overall CAA effort in analyzing the OSD-QDR initiative. What follows are more detailed analyses which got to the core of this review.

The ***OFP*** process adds the objectivity to this bottom up review called the 'QDR.' The OFP has its roots in the (***GMAS***), a method developed at CAA for examining ground maneuver systems issues in the context of the Joint Requirements Oversight Council (JROC) and the Joint Warfighting Capabilities Assessment (JWCA) forum. GMAS was initially developed to identify and assess deficiencies associated with desired ground maneuver capabilities. It has the capability to assimilate prioritized Universal Joint Task List (UJTL) tasks at the operational level for all four services, and merge the 'needs' list for further review in the JWCA process.

Again, the OFP process design took advantage of relevant features of the GMAS process. It was further developed in two workshops coordinated by CAA at the US Army War College (AWC). Here, sixty personnel from the HQDA staff, CAA, AWC, MACOMs, and Army components of the warfighting CINCs identified regional tasks in support of the National Military Strategy. They subsequently defined objectives, UJTL Tasks, and corresponding mission task - organized forces (MTOF) for each regional task. In accordance with the Component Commanders and DCSOPS, the CAA task group finished input to the OFP database, standardized OFP report format and completed refinement of the OFP database.

CAA utilized ***TAA-05*** campaign analyses of specified Defense Planning Guidance - Illustrative Planning Scenarios (DPG-IPS) as a baseline comparative review and reasonability assessment of OSD-QDR alternatives. As part of these reviews, we conducted deployability analysis of both the combat and total forces required; support force requirements analysis; and identified the conditions under which an early counter offensive might be conducted in the Southwest Asia MTW.

Another comparative analysis of weapon systems was done by CAA for the OSD Deep Attack/Weapons Mix Study (***DAWMS***). To that end CAA -

- Audited the utilization of the TACWAR and WORRM models in the DAWMS study.
- Determined the feasibility of the logistics assumptions used for the DAWMS baseline.
- Compared DAWMS with the Support Requirements Analysis - 2003.

CAA provided the Army's basis for challenging the basic assumptions which could have ultimately led to a reduction in Army force structure. Instead, we have helped the HQDA withstand the pressures to reduce at the expense of less efficient weapons systems and less effective force structures.

CAA's Analytical Products.

General. The great 19th century Prussian army officer and military theorist, Karl von Clausewitz, stated that the decision on the size of military forces "is indeed a vital part of strategy." By considering military resources as a basic element of military strategy we elevate the importance of military objectives and strategic concepts when studying force structure issues. Carrying this idea to its conclusion, policy and force structure become the justification for each other. This often results in a dilemma that defense planners seem to face more and more each day, i.e., keeping the two in balance.

Put another way, military objectives and military strategic concepts of a military strategy establish requirements for resources, and are in turn influenced by the availability of resources. If we fail to consider military resources as an element of military strategy, we may be faced with a strategy-capabilities mismatch. CAA analytical products are often used to mediate the differences between these competing forces.

Characteristics. Analysis resources are short and the demand for quick turnaround of information compels us to be in-the-loop on short, medium, and long term planning cycles. Decision-makers are confronted with quick decisions which often impact their areas of concern. To assist them in these decisions we often find ourselves in a quick reaction mode. In times of war, CAA must exercise its set of integrated models to assist the DA decision-makers in strategy and force evaluation analyses. In 'normal' times CAA's modelers must be at the ready to interject our suite of resource and force analysis models into the DA planning and programming cycles.

Each passing year we are asked to integrate Army planning processes with the rest of the Defense establishment to achieve a level of synergism that will carry us through this period of declining Defense dollars. Decisions such as which type of deep strike arms capability to procure, which service should employ them, and exactly how to employ them, is one example of concern to force developers. CAA has stayed in step with this change as just another way to maintain our viability as the Army's Center for Strategy and Force Evaluation.

Definitions. CAA has two primary products which it delivers to sponsors- memorandum reports for quick reaction analyses (QRA) and study reports for longer term efforts.

QRA are quick turnaround analyses, requiring precise answers to specific questions. QRA must not exceed six professional staff months of effort.

Studies and projects are longer term efforts which are usually more exploratory in nature. The similarity ends there. By regulation (AR 5-5) a study must be fully documented starting with the study directive all the way through the sponsor's critique. Projects differ from studies to the extent that projects are more of a support effort, usually of a technical nature, where the desired output/outcome is less certain at the onset of the work. Documentation of a project can take various forms befitting the product(s) delivered.

Inputs. Work comes into the Agency via several avenues. There are the well traveled routes built over many years of supporting traditional sponsors in their annual requirements. There are also the ad hoc situations which travel these same routes such as a Major Theater War (Desert Storm), or a major program review such as this year's QDR.

New customers and workload travel a more circuitous route, usually ending up at some point in between: a point where the demand for our services meets the supply of unfilled analysis requirements. Workshops, conferences, word-of-mouth, and other forums could be the genesis of a working relationship between CAA and new customers. We are always willing to open new avenues to support new customers

Outputs. The graph at Figure 1-4 illustrates the number of analytical products CAA delivered to sponsors over the past 10 years, peaking at 113 this year. Figure 1-5 illustrates the broad spectrum of support to sponsors. Both charts reflect high achievement when considering that we have experienced a significant decline in resources over the same period; a decline which has only recently stabilized.

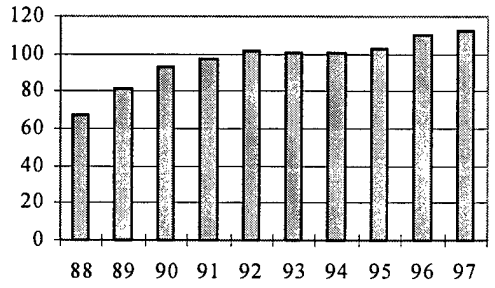


Figure 1-4. Number of Analytical Products Delivered to Sponsors

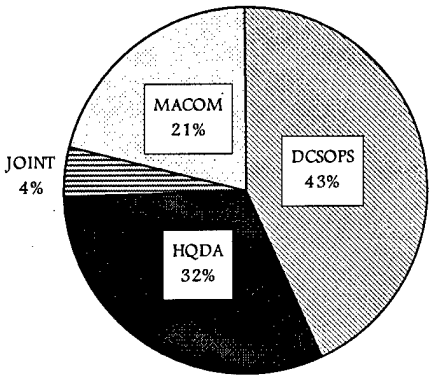
Future Considerations. To maintain our viability in the face of continuous change in the threat spectrum facing us, we must be receptive to new information; we must store and process it, and we must continue to monitor for change.

Problem solving in the post cold war era requires us to focus on the activities that traditionally have not been programmed and that require imaginative thinking. This type of thinking is fostered in various forums at CAA such as workshops, political/military games, and management planning conferences. Ultimately, however, CAA must incorporate logic into a computer program that complements the human ability to observe, recognize, discover, and generate imaginative ideas.

This large and important segment of CAA work is not portrayed in Figures 1-4 & 1-5. Without it we would have to increasingly rely on heuristics to develop reasonable answers to modern threats or else be forced to portray unreasonable scenarios to fit some of the older models. The longer we can maintain our modeling and technology edge, the better we will be positioned to meet this level and mix of analyses.

Customers. CAA's primary mission is to provide analytical support to HQDA and Army leadership. CAA analysis support is also provided to Army MACOMs, other Army activities, and occasionally Department of Defense (DOD) and US government agencies. Figure 1-5 presents a proportional breakout of CAA's FY97 analysis support to all sponsors.

A gradual and steady change in emphasis to CAA's workload sponsorship had its genesis in 1986 with passage of the Department of Defense Reorganization Act, otherwise known as the Goldwater-Nichols Act. Simply put, this Act established the command relationship between civilian authorities, the Chairman of the Joint Chiefs of Staff, the JCS, the commanders-in-chief of the combatant commands (CINCCs) and the Service chiefs. In short, it gave the CINCCs improved access in the National Command Structure.



MACOM	HQDA		Joint
AMC	ACSIM	DUSA(OR)	AFSAA
ARCENT	CAA	PAE	JCS
EUSA	DACS	PERSCOM	USCENTCOM
TRADOC	DASG	SARD	USEUCOM
USAMEDCOM	DCSINT	TAPC	
USAREUR	DISA	VCSA	

Figure 1-5. Studies & QRA
Delivered to Sponsors

In CAA's case it gave greater emphasis to analysis support of Army components for the Unified Commands. To elaborate, in 1987, seven percent (7%) of CAA's workload and professional staff time was in support of such Army components, referred to as 'Joint' and 'MACOMs' respectively in our system of accounting. This number has steadily climbed to where it is today at 25% (figure 1-5) workload and 30% of staff time, to include Army MACOMs not affiliated with Joint Commands.

CAA GLOBAL PERSPECTIVE AND VISION OF TOMORROW

The recently revised capstone Army doctrine document, FM 100-5-Operations, identifies key changes in the way the Army will fight, including-

- a focus on CONUS-based force projection;
- joint and combined/multinational operations;
- the need for simultaneous attack-close, deep, and rear;
- the requirements for operations other than war;
- increased need for versatility

Further complicating matters, the US Army faces a myriad of challenges including terrorism, both biological and chemical, and several smaller rogue states that possess "super power" weapons.

CAA is positioned to play a key role in the regular review of the future vision and goals of the US Army and the US military. In doing so we are developing new ways to quicken the process of matching resources with the threats and requirements of the day. To that end, the Objective Force Planning process developed by CAA will be further elaborated and integrated into the Total Army Analysis Process. To increase the versatility of our forces we must efficiently translate changes in threats/requirements into Military Task-Organized Force adjustments.

To the extent that the threats in the Defense Planning Guidance are unclear, CAA has to increasingly rely on intelligence sources, CINC-OPLANS, and even our own experience to make realistic representations. For example, the Objective Force Planning Workshops, using National Military Strategy as a starting point, defined 160 plausible

missions for the 2005 and 2010 timeframes. From these missions came plausible Army regional tasks and the Mission Task-Organized Forces (MTOF) necessary to accomplish these tasks.

FY97 ANALYSIS PROGRAM OVERVIEW

CAA's Goals. The goal of CAA is to provide high quality, and timely analyses that promote a strategic Army, capable of decisive victory, that can mobilize and deploy whenever necessary to preserve freedom and protect interests vital to a Free World.

In support of the National Security/Military Strategy, CAA provides analysis of the means to accomplish the National Military Objectives in various ways. Commonly known as the ends-ways-means test of the national military strategy, it is the overall method by which the US Government tries to keep all three aspects in balance.

The purpose of CAA's analysis program is to evaluate the means proposed by Army leadership as to ways of applying military force to satisfy the ends; ends being the national military objectives, and ultimately the National Security Strategy. Since the fall of the Soviet Union, our mission has expanded to include a sizable investment in studying ways to efficiently manage the Army's declining resource base. The relationship of ends-ways-means to four of six CAA study categories is notable by how closely our analysis workload correlates with the problems faced daily by national decision-makers, evidenced by the chart at Figure 1-9.

At the end of this chapter we graphically relate key FY97 study completions to all six study categories. In Chapter 2, we feature some of these same studies. Chapter 3 contains a brief summary for all FY97 analysis completions. Chapters 4 & 5 show how we are equipped and staffed to meet these requirements.

CAA Productivity.

To maintain our productivity levels we must continually provide our professional staff a wide array of training opportunities. This training is provided to develop and maintain core skills and also to open up new areas of analysis so that, as our mission evolves, we can stay abreast of emerging workloads. This evolution has never been more apparent than when considering that our productivity has increased at a rate of 114% over the past eight years at a time when our training expenditures rose more than 75% over the average of the preceding three years. The productivity and training trend charts which follow bear out this observation.

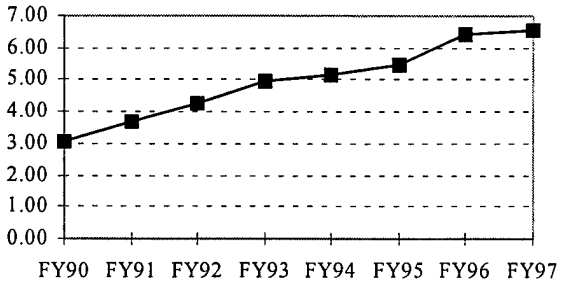


Figure 1-6. CAA Productivity Trend (Scale=Work Units per 10 PSY)

Not counted in the productivity chart above are an additional 27 analysis efforts in direct or indirect support of the 113 sponsored efforts, an increase of six over last year.

> ... productivity has increased at a rate of 114%...
>
> ... training expenditures rose more than 75%...

Taken altogether, these achievements are indicative of the dedication of CAA's work force to remain trained, viable, and relevant members of the Army management structure; and the positive contribution of CAA's Total Quality Management (TQM) program to FY97 productivity (see Resource Trends section below).

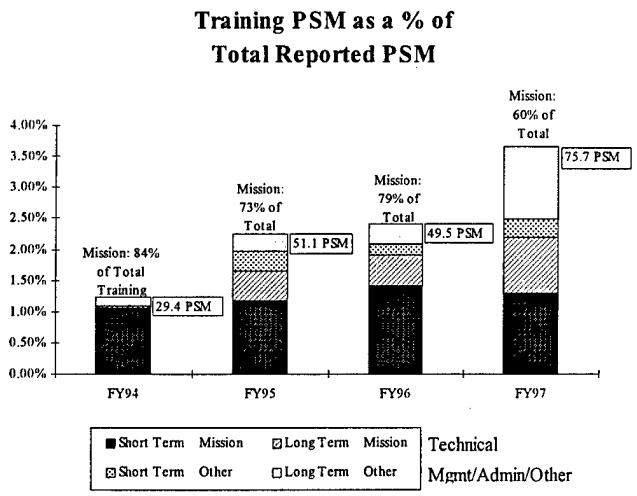


Figure 1-7. CAA Training

RESOURCE TRENDS

As can be seen in Figure 1-8, CAA's decline in budget and manpower has stabilized over the past two years. We have managed this decline through hiring freezes and careful planning of our discretionary spending. A stabilization in both resource categories is projected by current planning documents.

To recapitulate, CAA has increased productivity through a proactive Total Quality Management program, ongoing research and analysis activities, improved technologies and methods, and a robust training program. Future productivity gains depend on sustaining the hard-earned momentum built up in each of these initiatives over the preceding years.

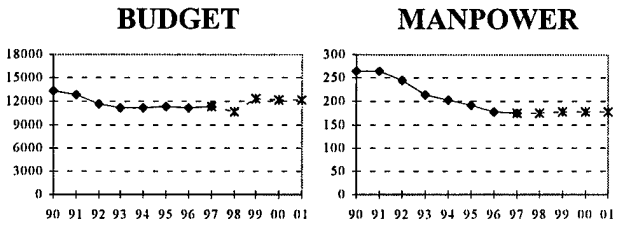


Figure 1-8. FY97 CAA Resource Trends

SUMMARY

Thus far, this report has touched on the workload and resource challenges facing CAA and the organization, equipment, and tools necessary to efficiently and effectively produce the highest quality and quantity products possible.

In the coming chapters are specific examples of the investments CAA has made to produce quick turnaround, multifaceted analyses; and the strides which have been taken to reorganize and re-equip in such a way to meld assets to maximize productivity and thereby remain useful to our sponsors' analytical needs and performance expectations.

Also in the coming chapters are highlights and descriptions of CAA FY97 accomplishments, which are the fruits of these investments and a harbinger of things to come.

CAA SUPPORT TO NATIONAL SECURITY STRATEGY

ENDS	WAYS	MEANS	CAA Analysis of...
Deter Aggression	Overseas Presence	Force 2000	Force Development Strategies Unconstrained by current force posture
Deter and Provide limited Defense against Nuclear Attack	Deterrence	Adaptive joint force packages	Pol-Mil analysis/ Arms control
Sustain Engagement with Allies and friends	OOTWs & Warfighting	Force Enhancers & Force Multipliers	Operational Strategy based on existing military capability
Reduce the National Debt	Improved Efficiency	Reinvention	Optimal Use of Resources

Figure 1-9, CAA Support to National Security Strategy

EXAMPLE ANALYSES UNDER CAA WORK CATEGORIES

- **FORCE DEVELOPMENT (FD) STRATEGY** (less constrained by current force posture)

  Authorization of CINC Assets to Requirements - (ACAR)
  Breaking the Phalanx Exploration - (BTP-EXP)
  Objective Force Planning - Workshops 1 & 2 - (OFP I & II)
  Quadrennial Defense Review Force Assessment (QDR-FA)
  Support Force Requirements Analysis 2005 (SRA-05)
  Theater Analysis for FXXI (TAF21)

- **POL-MIL ANALYSIS/ARMS CONTROL**

  Anti-Personnel Land Mine Study - (APLM)
  Anti-Personnel Land Mine Study / NEA - (APLM-NE)
  Anti-Personnel Land Mine Study #2 - (APLM2)
  Partnership for Peace & NATO/MED Working Party Pol-Mil Game - (PRISM-97)
  TALKING FISH 97 Political/Military Game - (TF97)

- **OPERATIONAL STRATEGY** (based on existing military capability)

  CENTCOM Operational Fires (COF-OF)
  Combined Forces Command Operations Plan 1998 (COP98)
  Decision Support Modeling (Resource Constrained) - (DSM-RC)
  Expediting the SWA Counteroffensive (ECI-SWA-97)
  Exercise Roving Sands 1997 (EXERS97)

- **OPTIMAL USE OF RESOURCES**

  Army Modernization Update-a Time-Constraint Problem - (AMUCK)
  Calculating Requirements for Deployment/Logistical Resources - (CARDEALR)
  Fleet Age Recapitalization - System Input Data Excursions - (FAR SIDE)
  Managing Research in Environmental Decision Making II - (MRED II)
  Statistical Analysis for the Land Disposal Restriction-Utah Group - (STALDRUG)

SUPPORTING ANALYSES:

- **PLANNING DATA/FACTOR DEVELOPMENT**

  Army Force Planning Data and Assumptions - 2003 - (AFPDA-03)
  Deep Attack Weapons Mix Study Scaling Factors - (DAWMS (SF))
  Personnel Attrition Rates in Land Combat Operations, Phase 4 - (PAR-P4)

- **TOOL & METHODOLOGY DEVELOPMENT** (in support of Operational and FD strategies)

  Biological Casualty Assessment Study (BIOCAS)
  Decision Analysis for MTMC Site Alternative - (DAMSA)
  Degrade Risk Matrix - (DRM-I)
  Health Assessment Risk - PERICLES Improvement - (HARPI)
  Measuring Ethnic Religious Communal Stress, Sub-Sahara - (MERCS-SSA)
  Planning Tool for Operational Fires - (PTOF)

Note: The status of ongoing model developments such as ARES, GDAS, and MOBCEM are detailed in Chapter 4.

Summaries Follow in Chapters 3.

ANALYTICAL EFFORTS OF SPECIAL INTEREST

INTRODUCTION

CAA studies assist in determining wartime requirements during operational contingencies and 'peacetime' requirements. To that end, CAA's role is to achieve an understanding of our sponsor's purposes, from that a reasonable deduction of their objectives, and through our models and other objective methods assist them in answering their questions.

Support to the Quadrennial Defense Review (QDR) was our most notable work in Fiscal Year 1997. Future force planning studies with potentially marked differences in the way the U.S. Army is configured and functions, promises to occupy a large part of our attention well into the next century. However, as with the study highlights that follow, CAA's mission promises to be more diverse than ever.

ANALYSIS AREAS OF INTEREST

Chapter 2 is presented in two parts. Studies deserving of special mention are presented next by the categories first mentioned in Chapter 1 and which again are:

- Force Development (FD) Strategy, less constrained by current force posture
- Pol-Mil Analysis/Arms Control
- Operational Strategy based on existing military capability
- Optimal Use of Resources
- Planning Data/Factor development
- Tool and Methodology development in support of Operational and FD strategies

The second part gives special mention to individuals within and from outside CAA, whose participation in and contribution to our study program were most notable.

FORCE DEVELOPMENT (FD) STRATEGY, LESS CONSTRAINED BY CURRENT FORCE POSTURE

Longer range strategies may be based on estimates of future interests, threats, objectives, and requirements, and are therefore not as constrained by current force posture. These long range strategies are more often global in nature and may require improvements in military capabilities. Military strategies can be regional as well as global, concerning themselves with specific threat scenarios.

The development of the Objective Force Planning (OFP) Process exemplifies this category of work. It started with strategic military objectives shaped by tenets of the National Military Strategy subsequently reduced to Mission Task Organized Force (MTOF) requirements. This was subsequently used for the Dynamic Commitment Force (DCF) Joint Workshop, a resources driven endeavor. The DCF Workshop focused on two possible timeline scenarios, both variations of a consecutive Major Theater War (MTW) scenario. It is the Army's position that there are more possible contingencies and therefore a baseline engagement force is required; a force that would not employ the rotational forces identified for the MTWs as a wedge for various combinations of Smaller Scale Contingencies (SSCs).

To that end, our goal is to integrate a further elaborated OFP process into the Total Army Analysis Process and thereby permit quicker turnaround analyses of force requirements from available resources. If we are able to efficiently analyze and plan for true requirements alternatives, we may be able to fairly allocate forces without over-extending any portion of the total force.

Strategic Lift Tradeoff (STRATLOFF). Recent and ongoing force downsizing and the attendant trend towards CONUS based Army forces, have increased the demand and importance of being able to rapidly deploy contingency forces worldwide, to meet US strategic and military objectives. Airlift becomes more critical for maintaining a rapid response capability, particularly within the first 3-4 weeks, until the sea lines of communication (SLOC) can be established.

This analysis examined the impact of augmenting existing and planned US strategic lift assets (air and sea) and tradeoff alternatives (C-17 vs. fast sealift). This study is an application of a multi-theater scenario using a newly developed high resolution, end-to-end simulation model called the Global Deployment Analysis System (GDAS).

Support Force Requirements Analysis - 2005 (SRA-05) As part of Phase I, Quantitative Analysis of Total Army Analysis FY 2000-2005 (TAA-05), conducted campaign analyses of specified Defense Planning Guidance Illustrative Planning Scenarios (DPG-IPS). We analyzed the strategic deployability of both the combat and support forces for these IPS, and determined the Echelon Above Division (EAD) Combat Support and Combat Service Support (CS/CSS) force structure required to support the programmed combat forces in these IPS. The results of the analyses served as the baseline for HQDA's POM build as well as the foundation for additional analyses in support of or follow-on analyses to the POM build.

This analysis was the most rigorous SRA in years. All inputs, assumptions, and allocation rules for quantitative analysis were subjected to a series of five HQDA Study Advisory Group reviews at both the Council of Colonels and General Officer levels. The reviews ensured the analyses remained focused on the important HQDA concerns; were synchronized with HQDA efforts in the Quadrennial Defense Review and Deep Attack Weapons Mix Study; used the most accurate and up to date data; and appropriately addressed critiques/concerns of both OSD PAE's and GAO's review of TAA-03.

Several enhancements were made to the support force requirements analysis in the following areas: casualty estimation, bulk fuel consumption, water distribution, supply distribution, enemy prisoner of war (EPW) estimation, transportation representation, linkage of support dynamics to the campaign combat dynamics, and calculation of Army support to other services.

For the first time, detailed concepts of logistical support in terms of time and space were developed, which directly linked the operational representations and dynamics of the campaign analyses to the support force requirements analyses. These concepts of support then served as the framework within which all other scenario information was developed, especially the transportation representation, time period durations, and timing of logistical build up parameters.

Additionally the FASTALS model was enhanced to accommodate more doctrinally correct representations of water and supply distribution; and prepositioned equipment sets and stocks; improved DNBI, WIA, and KCMIA estimates; improved EPW estimates; improved calculations of supply handling and transportation workloads; and more detailed bulk fuel pipeline construction and use.

The SRA-05 required force was approved by the VCSA in June 1997 and used as the baseline for the TAA-05 Resourcing Council of Colonels in September 1997.

Theater Level Analysis For Force XXI - Revised (TAF-21R). A theater level analysis of TRADOC's Conservative Heavy Division (CHD) design was conducted for the Chief, Force Integration and Management Division, Office of the Deputy Chief of Staff for Operations and Plans. The primary objective was to develop a fully defined dual Major Theater War (MTW) (East - West) force using the Conservative Heavy Division design vice the Army of Excellence (AOE) heavy divisional structure. This effort was conducted in three functional areas. First, theater level campaigns were developed for both South West Asia and North East Asia (Korea) scenarios under the TAA 05 threat conditions. The Conservative Heavy Division was substituted for the AOE heavy division in both scenarios, utilizing Force XXI information capabilities as appropriate. Second, support force analyses were conducted subsequent to the campaigns, with variations in eight basic areas: casualties; equipment damaged; posture profiles; class V consumption; consumption and maintenance rates; strength data; weight data; and class V buildup. Though these changes were made, the TAA 05 EAD structure and doctrine

remained the basis for the support force analysis. Third, the results of the campaigns and support force analysis were used as the basis for determining strategic lift requirements, and days to closure for a force with the CHD design and its required supporting forces.

Objective Force Planning (OFP). Objective Force Planning (OFP) is a CAA-developed methodology to derive Army mission-based force requirements in support of the National Military Strategy (NMS) from a large number of possible scenarios. Adapted from a strategy to task framework, OFP identified plausible Army missions in the 2010 timeframe and estimated their primary mission force requirements. This was accomplished by establishing an audit trail from the NMS and its major components to supporting missions, strategic objectives, joint tasks, and required force capabilities.

OFP was executed in a series of workshops attended by personnel from DCSOPS, DCSINT, National Ground Intelligence Center (NGIC), National Guard Bureau (NGB), Army War College (AWC), and G-3 and G-2 representatives from the five operational theaters. The workshop participants were divided into five groups by operational theater. Each group heard an initial intelligence briefing on how the intelligence community sees the world in the year 2010, and then began by identifying possible missions in their theater. Once all possible missions were identified, proceeded through the audit trail to determine the primary mission forces required to conduct each mission. Overall, OFP identified 159 possible missions and created a primary mission force for 31 of the missions

Dynamic Commitment Results. The J8 ran the Dynamic Commitment Games from December 96 to May 97. These games consisted of the Armed Forces allocating forces for missions, both Smaller Scale Contingencies (SSCs) and Major Theater Wars (MTWs), as they occurred over a possible 7 year future. The purpose of these games was to assist in determining what the needed force structure is for each service in support of the Quadrennial Defense Review (QDR).

CAA was asked by DAMO-SSW to conduct post-game analysis. We were given the Army force requirements that were allocated for each mission during Dynamic Commitment, and where not already done, identified the specific units that would be used for each mission. Once this was completed, we then analyzed the results to determine where the Army had shortfalls in force structure over the seven years future, where the Army would have shortfalls if a SSC was ongoing when a MTW began, and the overall OPTEMPO for each unit in the Army.

To do this analysis we used the tool MARTYR (Matching Army Requirements to Yearly Resources). MARTYR allows the analyst to establish a requirements file and a resources file, and then fill requirements from the resource file as they occur, or use a substitute unit if the unit being requested is not available. MARTYR keeps track of when each individual unit deploys, when it re-deploys, and when it is ready to deploy to a new mission. In this study we used the Structure and Manpower Accounting System (SAMAS) as the resource file, and the requirements, by mission over time, from Dynamic Commitment as the requirements file. We were able to identify shortfalls by mission when they occurred, shortfalls occurring in the SSCs when the MTW had already begun, and the OPTEMPO for each unit in the SAMAS.

Quadrennial Defense Review Long Range - Deployment Analysis (QDRLR-DA). This analysis was in support of ODCSOPS's submission of Army force closure objectives to OSD for the Quadrennial Defense Review (QDR). One of the scenarios addressed by the QDR was a European contingency in the 2016 timeframe. For this contingency, ODCSOPS developed postulated closures for the major combat units deploying to the theater. This strategic deployment analysis assessed whether this arrival schedule could be achieved in the context of the scenario, and that major strategic lift acquisition programs are completed as recommended in Mobility Requirements Study Bottom-Up Review Update (MRS BURU). The analysis was limited to deploying the force from the continental United States (CONUS) to a major European port. Onward movement to the tactical assembly area was not addressed.

Heavy Divisions Impact (HEADI). The Defense Planning Guidance, FY 99-03 provided illustrated planning scenarios for major regional contingencies (MRC) one of which is the near simultaneous MRC for West followed be East and includes the target requirements for major force arrivals for each MRC. In the context of this scenario, this strategic deployment analysis looked at deploying two

additional National Guard heavy divisions and associated combat support/combat service support to MRC-East at selected times during the contingency, and addressed the impact on the deployment of other major units.

Breaking the Phalanx Study (BTP). This study created a basis for analysis through modeling of the Revolution in Military Affairs (RMA) concepts proposed by LTC Douglas Macgregor in his book, "Breaking The Phalanx." It explored the merits of changes to Army and Joint force structure in terms of combat effectiveness, deployability, and supportability. Overall it provided sound analysis of LTC Macgregor's concepts, and identified areas of concern.

"Breaking the Phalanx" Exploration (BTP-EXP) was a Quick Reaction Analysis effort commissioned by DCSOPS on 3 Apr 97 to provide the Chief of Staff insights on operational effectiveness, deployability, and supportability of initiatives proposed by LTC Douglas Macgregor in his book. Acknowledging that Macgregor's forces are based on a Group structure instead of a Division structure, the study focused on comparing his proposals to base cases from previous work on Total Army Analysis 2005 (TAA05), and Campaign XXI studies. The comparisons encompassed deployment to and prosecution of the Southwest Asia - Major Regional Contingency.

The BTP-EXP study was an experiment which measured the effects of changing organizations, of modernizing those organizations, and of employing each with modified doctrine. These effects were assessed for operational efficiencies in the campaign, deployment flow and required logistical support.

Overall results of BTP-EXP, delivered 1 Jun 97, show that implementing the proposed changes to organization alone does not effect campaign outcomes. In fact, those changes begin to show improvement only when force capabilities are enhanced through modernization; even more so when that force is employed with future maneuver doctrine. This closely parallels an underlying theme of the book, that the future requires evolutionary change across all Army systems.

POLITICAL-MILITARY (POL-MIL) ANALYSIS/ ARMS CONTROL

In the Post Cold War World, the tendency for conflict of some magnitude persists. These conflicts are loaded with political and military difficulties that test old alliances, our national resolve, and our preparedness for dealing with unconventional threats. CAA takes a lead role in analyzing these issues through a continuous program of workshops and wargames. CAA uses its array of computer models, some of which were developed to deal with unconventional and/or Smaller Scale Contingencies; and subject matter experts including retired military officers who have had first hand experience with these situations.

TALKING FISH 97 (TF 97) Political-Military Game. Sponsored by National Defense University's Institute for National Strategic Studies (INSS) and in response to the Chairman, Joint Chiefs of Staff tasking to examine a spectrum of options for a post-SFOR military strategy in Bosnia. Four force options along a spectrum between total disengagement and a continuation of SFOR were assessed during the TALKING FISH 97 political-military game (22 July 1997).

The first option was Military Observers Only (ZFOR). Under this option there would be no combat units in Bosnia. The observers would be under NATO command and stationed throughout Bosnia to monitor and report on compliance and progress toward implementation of the Dayton Peace Agreements. US personnel supporting the observers, e.g., C3I, logistics, medical and air, would be required to make it viable. This option was judged best for compliance with a June 1998 deadline for removing US troops from Bosnia, but was judged the least effective for satisfying US strategic interests.

The second option was a European-Only Force (EFOR). Under this option there would be a transition period of approximately six months between the current SFOR to a force involving no US troops. Although this option would satisfy a June 1998 deadline for removing US troops, it would negatively affect US equity in NATO.

The third option examined was a NATO combat force stationed over-the-horizon (OFOR), and with US combat support/combat service support (CS/CSS) units and pre-positioned materiel in

Bosnia. Under this option, European combat forces would conduct continuous exercises in Bosnia, and US combat forces would conduct periodic exercises in Bosnia. This option would require significant logistical support, and was judged as requiring enhanced regional stability and progress toward civilian implementation of the peace agreements to make it viable.

The fourth option examined a European combat force stationed in Bosnia, with US units in support. This option best satisfied US and non-US NATO strategic interests due to the strong NATO presence maintained on the ground in Bosnia.

ATOMIUM 97 Political-Military Game. This game was sponsored by the U. S. Army Nuclear and Chemical Agency for the NATO Working Group 2 of Land Group 7 NATO. It was conducted at NATO Headquarters with NATO and Partnership for Peace (PFP) countries to examine new and emerging low level radiological challenges facing NATO and PFP; and NATO-PFP technical and procedural capabilities for operating in a low level radiological environment out to 2003. The purpose of ATOMIUM 97 was to evaluate the potential for sustained interaction to define and solve issues relating to Medical NBC standardization and interoperability.

Seven NATO and eight Partnership for Peace (PFP) countries participated in ATOMIUM 97. NATO-PFP team integration focused the game dynamics on low level radiological problems that may confront a NATO-PFP force during combined operations or crisis situations. ATOMIUM 97 clearly demonstrated this potential for sustained interaction through the open and lively dialogue established between NATO and PFP nations. Active dialogue produced the identification of the need for low level radiation detection and warning systems and radiological hazard awareness training, the management of dosage, and the accurate disclosure of information to the public, gained from media cooperation.

TAEBAEK 97 Political-Military Game. This game was sponsored by the Commander in Chief United Nations Command and Combined Forces Command (CINC UNC/CFC) and the Republic of Korea Ministry of Defense (ROK MND). The KIDA-CAA Joint Pacific Arms Control Study (JPACS) is a joint, multiyear, analytical effort to develop a range of candidate ROK-US chemical and biological protection, counter-proliferation and nonproliferation measures. JPACS is configured to include three Issues Workshops to be conducted at KIDA, and three political-military games to be conducted at CAA. Results from each phase are to be reported to the sponsors, and to the ROK-US Defense Analysis Seminars (DAS).

The Korean Institute for Defense Analysis (KIDA) conducted the Phase 1, Issues Workshop on chemical-biological protection issues. The results were used to frame the JPACS Phase I, TAEBAEK 97 political-military game. During TAEBAEK 97 the full spectrum of measures for the protection of ROK against regional chemical-biological threats within Northeast Asia were examined. Examination and identification included: pre-conflict and mobilization issues, regional defensive strategies, counteroffensive and post-conflict requirements. The next phase will focus on counter-proliferation measures.

Antipersonnel Landmine Study (APLM). The Antipersonnel Landmine (APL) QRA provided analysis to quantify the military utility of antipersonnel land mine use and assisted the Army in identifying/assessing doctrine and tactics-based alternatives to APL. This response to the Office of the Secretary of Defense (OSD) concluded that banning APL could significantly impact force effectiveness and the ability to achieve military objectives. Results from three separate theater simulations were corroborated with findings from previous tactical level analyses.

APLM II: APL II enlarged upon APL. In the first QRA, all mines were removed because pure antipersonnel (AP) systems do not currently exist and this was considered to be a lower bound for analysis. In APL II, the same examination of theaters was simulated using only antitank (AT) mines. Results confirmed and substantiated earlier findings from APL.

OPERATIONAL STRATEGY BASED ON EXISTING MILITARY CAPABILITY

Strategies based on existing military capabilities are operational strategies - those that are used as a foundation for the formulation of specific plans for action in the short-range time period. Therefore, operational strategies must be based on capabilities.

Logistics Support to the Counteroffensive (LSC). This study evaluated the capability of the logistical support forces in the Korea Theater of Operations to support counteroffensive operations north of the demilitarized zone (DMZ). In addition, it compared estimated logistical requirements to the distribution capability of the roads, and ROKA and US transportation units.

Roving Sands 97. The focus of Exercise Roving Sands 97 was the execution of a Joint Theater Missile Defense (JTMD) fight within the framework of an overall air campaign; complemented by the backdrop of limited ground and naval operations. The focus of effort for CENTCOM and its component commands was the exercise of JTMD C4I, JTMD attack operations and JTMD active defense operations. The objective for ARCENT G-3 Plans was to conduct future plans development, specifically for the Phase III Counteroffensive. The CAA Deployable Analytical Support Team (DAST) supported ARCENT G-3 Plans with a highly responsive analytical package which included the Theater Ballistic Missile (TBM) model developed by the CAA EAD/NBC Division.

The execution of the Exercise Roving Sands operation order sought to attain the following war termination objectives:

- Restore territorial integrity of the attacked nation.
- Destroy enemy offensive capabilities.
- Destroy enemy chemical and biological stockpiles and production facilities as well as the means to deliver them, especially ballistic missiles. Additionally, deter further proliferation for CW/BW technology within the region.
- Eliminate enemy capability to conduct future intraregional aggression. The endstate was the full restoration of territory, as a viable nation-state without ballistic missiles or WMD, as well as the elimination of additional threats.

CAA deployed five personnel to Fort Bliss, Texas to support the exercise. This included three analysts from the Operations Capabilities Assessment - SWA (OCA-SWA) division, and two from the EAD/NBC division who attended to examine Theater Missile Defense (TMD) and Operational Fires. The team brought laptop computers containing the theater simulation and TMD models, as well as an operational fires model. The Deployable Analytical Support Team (DAST) joined the G-3 planners in wargaming the different branches and sequels of the operation; and then using their analytic tools, conducted detailed analysis of 13 possible branches. The results of this analysis were briefed to the acting CG, ARCENT, MG Ivany, who incorporated the analysis in making his Course of Action (COA) decision.

For the first time, the DAST brought with it the capability to examine operational fires. The ARCENT staff found the CAA analysis extremely useful in planning operational fires. The efficiencies realized in applying CAA's analysis to the joint targeting of operational fires enabled ARCENT to achieve its operational objectives nearly two weeks earlier than expected.

Decision Support Modeling (Resource Constrained) (DSM-RC). This series of studies is a continuation of operations analysis done for the United States Forces Korea (USFK). The DSM series looked at the current year campaign and analyzed excursions and alternative Courses of Action. This analytic effort looks at the risks associated with the USFK OPLAN when Korea is the second of two MRCs (MTWs). A detailed analysis was done comparing the resource constraints of the integrated TPFDD with the allocation of combat, combat support and combat service support forces and supplies going to the first MRC.

Combined Forces Command Operations Plan (COP). This was performed to support the CINC Combined Forces Command wargame conducted in July 1997. The analysis was a parametric look at the campaign impact of North Korean (nK) chemical usage and nK Army capability given current economic conditions. This study looked at the current year campaign and completely updated both the friendly and enemy order of battles from the DSM series. This analysis was used as the basis for a follow-on study on looking at possible force alternatives to counter the changing threat.

OPTIMAL USE OF RESOURCES

As we try to stretch defense dollars to cover a wider range of threats, the Army has become far more cost conscious. CAA is often asked to analyze current ways of doing business so that we can squeeze more efficiency out of declining defense budgets. Included in the cost spectrum are environmental concerns which by law and regulation will drive up the cost of defense if neglected. Other major topics under this analysis category are the development of acquisition and investment strategies.

Statistical Analysis for the Land Disposal Restriction-Utah Group (STALDRUG). Everyone in America is not the same weight, size, or stays in the same industry for the same number of years. Everyone in America is different. Why then, do most environmental risk assessors use a single value to represent such diversity when determining health risk based Land Disposal Restrictions (LDRs), or worse, rely on technology driven LDRs to determine standards for the disposal of hazardous waste?

The US Army Concept Analysis Agency (CAA) in conjunction with the US Army Center for Health Promotion and Preventive Medicine (CHPPM) incorporated diversity using Monte Carlo simulation in the Statistical Analysis for Land Disposal Restriction - Utah Group (STALDRUG) study. The study determined health risk based (as opposed to technology based) LDR concentration levels for chemical agent associated waste in the State of Utah. The basic approach was to identify the exposure scenario (including the exposure pathways); identify the exposure model; conduct research to determine input parameters based on the exposure scenario; conduct Monte Carlo simulation to incorporate the inherent uncertainty relating to the model input parameters; and analyze output distributions and select an output distribution percentile based on risk.

By developing LDRs no more stringent than needed to protect human health and the environment, regulators may accomplish their environmental protection mission while making no more than reasonable resource demands on affected parties.

Calculating Requirements for Deployment/ Logistical Resources (CARDEALR). CARDEALR fits two of our work categories, as do many of our analyses; especially those which are "tools developed" in the same year they are applied. This was the case with CARDEALR.

Due to the imminent danger experienced by Stabilization Force (SFOR) soldiers in Bosnia, the US Army instituted a policy to rotate units every eight to ten months. During the rotation, key nodes (base camps, intermediate staging base, rear staging base) in the flow of troops approach or exceed personnel and vehicle capacity. In anticipation of the Oct - Nov 97 rotation of the 1st ID (Fwd) and the 1st AD, the 1st ID (Fwd) through USAREUR requested the US Army Concept Analysis Agency (CAA) to automate and incorporate animation in existing redeployment models, to allow for the more efficient use of division staff personnel.

The Calculating Requirements for Deployment and Logistical Resources (CARDEALR) Quick Reaction Analysis (QRA) developed a model (given changes in deployment schedule) that: instantaneously tracked the movement of forces in/out of Bosnia; instantaneously highlighted key nodes (base camps, ISB, RSB) that exceed capacity; provided instantaneous staff coordination; allow for "what if" scenarios to allow the staff to identify and solve problems before they occur; and is user friendly. In Sep 97, CAA developed, delivered, demonstrated, and trained division personnel on the use of the model that contained the above attributes. The division G3 plans section immediately incorporated the model in the planning and executing phase of the redeployment operation. Due to the benefits of the model, 1st ID (Fwd) was going to recommend to the SFOR Commander that a similar model should be developed for the proposed SFOR June 98 redeployment.

PLANNING DATA/FACTOR DEVELOPMENT

Within the Army and CAA there is a constant need for current, standard planning data from which we can project future outcomes and requirements. CAA finds itself on the sending and receiving ends of this essential element of Army planning and analysis.

Degrade Risk Matrix (DRM-I). An increasing number of countries have or will have theater missile capabilities. Theater missiles include ballistic missiles, cruise missiles, and air-to-surface

missiles whose targets are within a given theater of operations. These capabilities, coupled with the growing evidence of weapons of mass destruction (WMD), represent a serious threat to US-deployed, allied and coalition forces, population centers, and critical assets worldwide. The proliferation and growing sophistication of this threat stress the current theater missile defense (TMD) capabilities of the US and its allies. The tactical ballistic missile (TBM) threat was the focus of the DRM-I analysis.

Combat airbases are high priority targets of TBMs during an enemy major offensive campaign. The purpose of this effort was to examine the extent of degradation to combat airbase operations when disrupted by both conventional and chemical TBMs, which have successfully "leaked" through U.S-deployed and allied defenses. In particular, the reductions in combat aircraft sorties were examined.

The DRM-I analysis covered multiple combinations of variations in the total number of chemical TBMs, the enemy TBM attack strategy, the defense strategy, the effectiveness of each successful TBM in degrading airbase operations, and the duration of the effects of the chemical agents.

Personnel Attrition Rate (PAR) Studies. The Personnel Attrition Rate (PAR) studies were a major effort to survey, review, summarize, critically assess, and extend the past work on personnel attrition rates in historical combat operations. Everyone interested in personnel casualties can find much material in the PAR study report for frequent reference and study. In addition to a wealth of interesting findings and observations, they contain a great many tantalizing bits of evidence suggesting profitable topics for further research and investigation. The (PAR) studies were started by the US Army Concepts Analysis Agency in 1992 and completed in 1997. The overall approach throughout all phases of the PAR study was to:

- Assemble existing studies and data.
- Survey, summarize, and critically review the literature.
- Computerize as much of the data as possible.
- Perform our own analyses of the data.

Report results. The scope of the PAR study had to be limited in various ways. For example, it dealt only with personnel strengths and losses, not equipment losses. It focused mainly on battle casualties, not non-battle losses. It used only data on actual combat operations, not numbers from war games and simulations. It employed only readily tabulated data, and did not go into original archival historical research. It consulted mainly works in English, but included some essential works in other languages such as German and Russian. Finally, it used only those studies that based their findings on a definite body of non-proprietary data. Studies that used no data, or only proprietary data, were not considered.

The following is a list of the products of this work. All are unclassified with unlimited distribution and readily available from the Defense Technical Information Center (DTIC) or the National Technical Information Service (NTIS). So all those interested in personnel casualties can have copies available for reference and study.

- Database of Battles–Version 1990 (Computer Diskette), US Army Concepts Analysis Agency, 30 April 1991, AD-M000 121. A computer diskette containing comprehensive, carefully reviewed and edited data on 660 battles of the last 400 years.

- Personnel Attrition Rates in Historical Land Combat Operations: An Annotated Bibliography, CAA Research Paper CAA-RP-93-2, June 1993, AD-A268-787, 472 pages. A comprehensive survey and annotated bibliography of over 230 past studies dealing with personnel attrition. Four comprehensive indexes (by author, title, key word, and subject) make it easy to find material needed for a particular study. The description of each individual item includes a full bibliographic citation, a statement of its objectives and scope, the populations and casualty types it deals with, the time frames involved, the situational descriptors it used, the data sources it employed, a summary of its main findings, and an incisive critique and commentary.

- Personnel Attrition Rates in Historical Land Combat Operations: Susceptibility and Vulnerability of Major Anatomical Regions, CAA Research Paper CAA-RP-93-3, August 1993, AD-A270 766, 72 pages. The most complete analysis of the susceptibility (probability of being hit) and vulnerability (probability of becoming a casualty, given a hit) of the major anatomical regions, as inferred from statistical data on wounds actually taken in combat.

◆ Personnel Attrition Rates in Historical Land Combat Operations: A Catalog of Attrition and Casualty Data Bases on Diskettes Usable With Personal Computers, CAA Research Paper CAA-RP-93-4, September 1993, AD-A279 069, 177 pages. A comprehensive survey of such works.

◆ PAR Data Disks, (Diskettes accompanying the preceding research paper), AD-M000 344 (compressed Quattro Pro format). Revised set of diskettes, AD-M000 368 (uncompressed Lotus 1-2-3 format). A set of diskettes containing the data identified in the previous publication (the catalog of attrition and casualty data bases on diskettes).

◆ Personnel Attrition Rates in Historical Land Combat Operations: A Note on the Probability of Readmissions and Multiple Wounds, US Army Concepts Analysis Agency Research Paper CAA-RP-94-2, April 1994, AD-A280 498, 59 pages. Shows that a simple model can be used to approximate the distribution of the number of readmissions to a hospital due to wounding and of the number of multiple wounds per case, as reflected in actual combat operations.

◆ Personnel Attrition Rates in Historical Land Combat Operations: Some Empirical Relations Among Force Sizes, Battle Durations, Battle Dates, and Casualties, CAA Research Paper CAA-95-1, 1 March 1995, AD-A298-124, 149 pages. A study of some persistent, long-term historical trends in force sizes, battle durations, and casualty rates as given in the statistical records of actual combat operations.

◆ Personnel Attrition Rates in Historical Land Combat Operations: Addenda to the Annotated Bibliography, CAA Research Paper CAA-RP-95-2, 1 April 1995, AD-A294-527, 107 pages. Adds thirty titles to the annotated bibliography described in item 2 above, making more that 260 titles included altogether.

◆ Personnel Attrition Rates in Historical Land Combat Operations: Losses of National Populations, Armed Forces, Army Groups, and Lower Level Land Combat Forces, CAA Research Paper CAA-RP-95-5, April 1996, AD-A308-506, 172 pages. This paper uses historical data to examine selected aspects of the personnel losses and loss rates of national populations and of armed forces at echelons above division in wars, theater operations, and tactical actions.

◆ Personnel Attrition Rates in Historical Land Combat Operations: Losses of Divisions and Lower Level Land Combat Forces, CAA Research Paper CAA-RP-97-1, 30 April 1997, AD-A325-455, 379 pages. Extends the previous paper's findings to echelons at and below division.

Many findings were developed during the PAR studies. A sample of them are cited below to give the flavor of the results obtained. The PAR documents cited above provide the data and analysis to back them up, as well as a fuller description and discussion of them.

◆ On the average, in the face of dramatic improvements in weapons technology, casualty rates in actual combat operations have steadily decreased for the last 400 years,. In fact, both the winner's and loser's casualty fractions in battles have declined approximately exponentially at a rate of about 40 percent per century.

◆ The ratio of WIA to KIA has been relatively constant at about 4:1 or 5:1 for many years.

◆ Personnel force ratios have little or nothing to do with which side wins, who advances, or how many losses are suffered in battles or wars.

◆ Fratricide incidents are common, and on the average may amount to about 10 percent of the friendly casualties caused by enemy fire.

◆ In a war, civilian casualties may well equal the military casualties. This has important implications for peacekeeping and other military operations short of all-out war.

◆ The distribution of wound sites over the body has remained relatively stable for many years.

◆ Often the number of hospital readmissions for wounds received in battle follows approximately a geometric statistical distribution.

◆ From 1600 to the present day:

◆◆Battle durations have tended to increase.

◆◆The force ratio favoring the defender has been fairly stable over time, typically being close to unity. However, defenders typically fight at a slight numerical disadvantage.

◆◆The casualty exchange ratio favoring the defender has been fairly stable and typically slightly less than one. The fractional exchange ratio favoring the defender also tends to be slightly less than one.

◆◆The casualty exchange ratio favoring the winner has been fairly stable. The winner's casualty fraction is much lower than that of the loser. The winner's casualty fraction is typically about half that of the loser.

◆◆Smaller forces take and inflict proportionately more casualties than larger forces. This appears to be a "diminishing returns to scale" phenomenon.

◆◆Despite its popularity as an assumed relationship, casualty numbers often are not directly proportional to the exposure in personnel-days. (Here exposure in personnel-days is defined as the product of the average number of personnel in combat and the duration of the combat in days.) Hence, in general it is incorrect to apply a simple proportionality of casualties to exposure levels without considering other important factors.

◆◆In actual combat operations, on the average the casualty exchange ratio favoring the defender decreases as the force ratio favoring the defender increases. Also, on the average the casualty exchange ratio favoring the winner decreases as the force ratio favoring the winner increases.

◆◆However, on the average the fractional exchange ratio favoring the defender does increase as the force ratio favoring the defender increases. Also, on the average the fractional exchange ratio favoring the winner increases as the force ratio favoring the winner increases.

◆ For data since about 1850 A.D., nonbattle deaths generally exceeded those due to battle casualties until about 1900 A.D. After 1900 A.D., deaths due to battle casualties have exceeded nonbattle deaths. Presumably this is mainly a reflection of major improvements in the branch of medical theory and techniques concerned with the maintenance of public health by avoiding epidemics.

◆ In recent US wartime experience, accidents (rather than illness) cause the majority of nonbattle deaths. Perhaps more emphasis on accident prevention measures would reduce the death toll.

◆ Historically, 99 percent of all army group battle casualties are taken by formations at army level and below. Over 99 percent of all army battle casualties are taken by formations at corps level and below. Well over 90 percent of all corps battle casualties are taken by formations at division level and below. Infantry regiments account collectively for about 85 to 93 percent of an infantry division's casualties. An infantry division's major combat elements (infantry regiments, field artillery units, machinegun battalions, mortar batteries, and so forth) generally account for about 95 to 99 percent of the division's casualties.

◆ A simple autoregressive model quite adequately fits the time series of US Army casualty data for division, corps, and army units operating in Northwest Europe during World War II.

◆ Divisions, brigades, battalions, and companies normally experience a considerable percentage of casualty-free days. Some percentages found in the data at our disposal are as follows: divisions 20 to 40 percent, brigades 30 percent, companies 20 to 70 percent.

◆ The hospitalized psychiatric battle stress casualty rate can be expected to be given by some base rate plus a number equal to about 10 or 12 percent of the hospitalized (i.e., seriously) wounded in action. Psychiatric cases can be expected to account for about 30 to 40 percent of all nonbattle disability discharges, and hence to be the leading cause of nonbattle disability discharges.

◆ Friendly casualties tend to increase as the level of friendly fire support increases.

◆ Casualty fractions and rates tend to follow approximately a lognormal statistical distribution.

◆ Simple models can approximate the build-up of forces and casualties from the start of a war to its culmination point.

TOOL AND METHOD DEVELOPMENT IN SUPPORT OF OPERATIONAL AND FORCE DEVELOPMENT STRATEGIES

At the base of the CAA study program are models, methods, and other analytical tools which enable us to produce reliable and sensible answers to a new generation of complex problems and questions.

Biological Casualty Assessment Study (BIOCAS). BIOCAS is an analytical study covering 23 different scenarios, two major theaters of war (Northeast Asia and Southwest Asia), and three different biological agents (anthrax, botulinum toxin, and staphylococcus enterotoxin B). The study builds on previous analytical work at CAA. It uses casualty data generated by the Institute for Defense Analysis' (IDA's) BIOSTRIKE model.

BIOCAS results include suitable probabilities for inclusion in the Patient Flow Model and a suggested review of the 15-day evacuation policy. In several scenarios, the evacuation policy required large numbers of injured personnel to be held in theater without any compensating number being returned to duty. This radically increased the number of required medical beds.

Note: The status of ongoing model developments such as ARES, GDAS, and MOBCEM are detailed in Chapter 4.

OTHER ITEMS OF SPECIAL INTEREST

NATIONAL & INTERNATIONAL MILITARY OPERATIONS RESEARCH ACTIVITIES

CAA engages in a host of activities involving the national and international exchange of professional information and techniques; the professional development of analysts; the promotion of research and development efforts in the field of military operations research; and the application of advanced technologies. Collectively, these efforts help maintain the expertise and essential analytical perspective important for understanding and analyzing current issues. Some of the more notable of these activities are identified in this section.

- Eighth US/French Operations Research/Simulation at Centre for Defense Analyses, Paris. Chief, Tactical Analysis Division organized US participation.

- Second US/Canadian Symposium on Operations in August 1997 at Center for Strategic Leadership, Army War College. CAA participants included the Director, CAA; Chief, Conflict Analysis Center; and Chief, Tactical Analysis Division (Organizer).

- Chief, Tactical Analysis Division participated in Quadripartite Working Group on Army Operational Research in Ottawa, CA in February 1997. He continues to serve as the Chair, Information Exchange Group on Historical Data Analysis.

- CAA hosted the US Military Liaison Team, Poland as part of the Joint Contact Team Program of the Partnership for Peace program 24-28 February 1997. CAA organized briefings from CAA, TRAC, and AMSAA on "information on the research work in the realm of systems analysis and its application in designing weapons systems and development of the military technology."

- Chief, Tactical Analysis Division organized the Second US/German Workshop on Operations Research held at Center for Strategic Leadership, US Army War College, November 1997.

- Chief, Tactical Analysis Division continued participation on the Board of Directors of the Military Operations Research Society. CY 96/97 responsibilities included chairing the Membership Committee, running the Rist Prize competition, and working on the Junior/Senior Analyst Program Committee for 65th MORS Symposium at Quantico. CY 97/98 efforts include organizing the Junior/Senior Analyst program for 66th MORS Symposium at Monterey, chairing the Heritage Committee, and running the Rist Prize competition.

- CAA organized the Army Operations Research Symposium XXXVI held at Ft Lee, Virginia in November 1997.

- Chief, Tactical Analysis Division and selected CAA employees participated in an Army International Activities Conference in Williamsburg 27-30 May 1997. The conference was chaired by the Deputy Undersecretary of the Army (International Affairs).

FOREIGN VISITORS AND DIGNITARIES

CAA has always participated with foreign nations in the exchange of knowledge and information in the area of military operations research. The world situation following the end of the Cold War however, has served to magnify the importance of these ongoing dialogues. Allied nations continue to share information because if recent trends continue, ad hoc coalitions and alliances will be the order of the day when it comes to settling international conflicts. To that end, CAA was privileged to host the following list of dignitaries:

Canada:

- COL J. Ian Fenton, National Defence Headquarters
- Mr. Rolf E. Kluchert, Department of National Defence
- Mr. Gilbert LaFond, Department of National Defence
- Dr. Jacques Levigne, Defence Scientist, Embassy of Canada
- Dr. Ronald Thomas, Counsellor Defence Research and Develoipment, Embassy of Canada

Germany:

- Mr. Kurt Grau, Department Manager, Industrieanlagen-Betriebsgesellschaft MBH

Japan:

- MAJ Yukoh Umeki, Program Management Group, Japan Air Self Defense Force
- Mr. Yusuke Takizawa, Operations and Analysis Office, Defense Plans and Operations Division, Japan Air Self Defense Force
- Mr. Shigeru Musori, Director Systems Analysis Office, Planning and Programming Division, Bureau of Defense Policy, Japan Defense Agency
- Mr. Satoshi Maeda, First Secretary, Political Section, Embassy of Japan

Korea:

- LtGen (ret) Hyung Sun Kim, President, Korea Institute for Defense Analyses
- Dr. Kwan Chi Oh, Vice President, Korea Institute for Defense Analyses
- Dr. Bon Hak Koo, Head, Research Cooperation, Korea Institute for Defense Analyses
- Dr. Yong Chan Jung, Associate Research Fellow, Korea Institute for Defense Analyses Engineer and Scientist Exchange Program at CAA 1996-97
- Dr. Jong Soo Kim, Defense Research and Development Attache, Embassy of Korea
- Mr. Jae Wook Lee, Assistant Researcher, Korea Institute for Defense Analyses, Engineer and Scientist Exchange Program at CAA 1997
- Dr. Jun Sik Kim, Researcher, Korea Institute for Defense Analyses, Engineer and Scientist Exchange Program at AMSAA 1997
- Dr. Hyung Kon Moon, Senior Researcher, Korea Institute for Defense Analyses
- Dr. Sang Bum Kim, Senior Researcher, Korea Institute for Defense Analyses
- Dr. Hwan Cheong Kim, Senior Researcher, Korea Institute for Defense Analyses
- LTC Jong Hyeon Soh, C-3 Operations Division, Korea Joint Chiefs of Staff
- LTC Jae Ho Lee, C-3 Combat Coordination Division, Korea Joint Chiefs of Staff

- MAJ Jae Ik Yoo, Arms Control Office, Korea Ministry of Defense

Poland:

- COL Dr. Sc. Eng. Wlodzimierz Miszalski, Commandant of the Institute of Logistics, Military University of Technology of Poland

- COL Dr. Sc. Eng. Andrzej Chojnacki, Dean of Faculty of Cybernetics, Military University of Technology of Poland

Turkey:

- Lt Oguz Okuyucu, Turkish Air Force Exchange Officer at AFIT

United Kingdom:

- Mr. Michael J. Larcombe, Director of Science (Land), Minisrty of Defence

- Dr. Roger N. Tyte, Wargaming and Simulation Centre, Centre for Defence Analysis

- Mr. David J. Baker, Defence Equipment Joint Technologies, Embassy of the United Kingdom

- Dr. George Cran, Centre for Defence Analysis

- Dr. Alan M. Dixon, Attache Defence Equipment (Land), Embassy of the United Kingdom

- COL Charles S. Grant, Directorate General Development and Docrtine, British Army

- Mr. James Platt, Science (Land) Directorate, Ministry of Defence

- Lt Col Cedric Sloan, Science (Land) Directorate, Ministry of Defence

PROFESSIONAL SOCIETIES

AORS XXXV - 12-14 November 1996; Fort Lee, VA. The US Army Materiel Systems Analysis Activity (AMSAA) sponsored this annual event. CAA personnel made the following presentations:

Presenter	Topic
Mr. J. Theodore Ahrens	Political and Economic Risk in Countries and Lands Evaluation Study
Ms. Julianne Allison	Mobilization Capabilities Evaluation Model Update
Ms. Renee Carlucci	Theater Level Simulation of Ammo Distribution Systems
Ms. Linda Coblentz	Army Modernization Prioritization System and Value Added Analysis
LTC(P) William F. Crain	Force XXI Theater Modeling of Information Operations
Mr. Karsten Engelmann	Attack, Passive, Active, BMC4I Pillar Integration
Dr. Robert L. Helmbold	Personnel Attrition Rates in Historical Land combat Operations
LTC Daniel Maxwell	What is the Value of Destroying a Target?
Mr. Steven Siegel	Evaluation Of Land Value Study

65th MORS Symposium - 10-12 June 1997; hosted by the Marine Corps Combat Development Command, Quantico, Virginia. Fourteen papers were presented and seventeen CAA personnel accompanied Mr. Vandiver to this annual event. The presenters and papers were:

Presenter	Topic
LTC Stephen Parker	Modeling Integrated Logistics Support Operations for "Fighter Wing Equivalents" Through Dynamic Simulation
Dr. Betsy Abbe	Advances in End-to- End Mobility Modeling
Dr. Robert Helmbold	Personal Attrition Rates

Mr. Walter J. Bauman	Combat MOEs in Relationship to Historical Evidence
LTC(P) William F. Crain	SRA 05 Early Counter Offensive Excursion
LTC Dan Maxwell	Practical and Theoretical Considerations When Integrating Linear Programming and Multi-Attribute Utility Theory: Lessons Learned in Large Scale Applications
	Joint Logistics Analysis in Support of DOD Resource Allocation: DAWMS LOG
Mr. Karsten Engelmann	Lower Tier Stockage Alternatives-Missile Inventory Solutions (LOTSA-MSLS)
CPT Wm. M. McClagan	Air Defense Artillery Force Structure Analysis-2005
MAJ (P) Patrick J. DuBois	Cost Analysis for the Land Disposal Restriction Utah Group (CALDRUG)
Mr. James J. Connelly	Managing Research in Environmental Decision Making (MRED)
LTC Martemas Arnwine	Objective Force Planning
MAJ Steven Aviles	Force Structure Analysis
Mr. Wallace Chandler	Advanced Regional Exploratory System (ARES)

Best Working Group Paper

MAJ (P) Patrick J. DuBois received the award for Best Working Group Paper for Working Group 22, Cost and Effectiveness Analysis.

PRESENTATIONS AT OUTSIDE FORUMS

Institutes for Operations Research and Management Science (INFORMS), October 1996, New Orleans, Louisiana:

LTC Maxwell presented- NBC Modernization Prioritization Methodology.

Institutes for Operations Research and Management Science (INFORMS), May 1997, San Diego, California:

COL Andrew Loerch presented a paper on behalf of LTC Daniel T. Maxwell titled- "DAWMS - What's the Value of Destroying a Target?"

Concurrent with the INFORMS Conference, LTC Daniel T. Maxwell provided "Introduction to Operations Research Techniques" training to select Saudi Military officers in Saudi Arabia during May 1997.

Analytic Combat Modeling and Simulation Workshop, March 1997, Army Research Office, Research Triangle Park, North Carolina.

Presentations:

Theater and Regional Campaign Analysis by Mr. Gerald E. Cooper

Advanced Regional Exploratory System (ARES) by Mr. John E. Shepherd

1997 IEEE International Conference on Systems, Man, and Cybernetics, October 1997, Orlando, Florida.

Presentation:

Integrating Linear Programming and Multi-Attribute Utility Theory presented by LTC Daniel T Maxwell on behalf of the other team members- Ms. Linda A. Coblentz and LTC Rodger A. Pudwill.

AWARDS AND RECOGNITION

Army Study Highlights (ASH), Volume XVII. The following CAA study was recognized for excellence and published in ASH Vol XVII:

Study Director(s)	Study Title
LTC(P) William F. Crain	Warfighting Analytical Support to Third U.S. Army (WAS-TUSA)

Recognized for the resource analysis portion of a TRADOC study:

LTC Roger A. Pudwill	Antiarmor Requirements and Resource (A2R2) Analysis

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Dr. Wilbur B. Payne Memorial Award Nominations - 1997. The studies listed below were nominated to receive the Dr. Wilbur B. Payne Memorial Award in 1997 in their respective categories. Nominations were limited to one per category.

Group Award: Lower Tier Stockage Alternatives -Missile Inventory Solutions

-EAD/NBC Division

Individual Award: Statistical Analysis for the Land Disposal Restriction-Utah Group (STALDRUG) Study

- MAJ (P) Patrick J. DuBois

Dr. Wilbur B. Payne Award Winner - 1997. MAJ (P) Patrick J. DuBois received the Individual Award for the Statistical Analysis for the Land Disposal Restriction-Utah Group (STALDRUG) Study.

FY97 Study Directors' Luncheon. CAA held this annual luncheon on Thursday, 6 November, 1997 to honor individuals who served as study directors for studies and other analytical efforts completed during FY97. The guest speaker was Mr. Eric J. Coulter, Director, Projection Forces Division, OSD (PA&E) (GPP). 70 individuals received recognition for completing 140 studies, QRA, Projects, or RAA during FY97. Certificates of Achievement were awarded to 38 individuals who directed a total of 88 studies and quick reaction analyses; Certificates of Accomplishment were awarded to 32 individuals who directed a total of 52 projects and research analysis activities.

The Director's Award for Excellence. The 24th Annual Dinner Dance was held on 1 April 1997. As in past years, this event was the venue for presenting the Director's Award for Excellence. The Director hosted this annual event and presented the Director's Award for Excellence to the following individuals:

Individual Support Award: Ms. Barbara J. Gay

Individual Analyst Awards: COL James L. Hillman
LTC Roger A. Pudwill
Mr. Karsten G. Engelman

Team Award:

Deep Attack Weapons Mix Study

COL James A. Moreno
LTC Daniel T. Maxwell
MAJ Jerry A. Glasow
Mr. John W. Warren
Ms. Rosie H. Brown
Mr. Louis J. Albert
Mr. Matthew J. Ogorzalek
Ms. Linda A. Coblentz
Ms. Linda C. LaBarbera
LTC Robert C. Bailey
LTC Stephen R. Parker
Mr. Richard G. Poulos

The Director also took advantage of this occasion to present the Special Emphasis Program Award for **Outstanding Female Civilian Employee - Fort Myer Military Community** to Ms. Rosie H. Brown.

In May, on the occasion of the CAA Asian/Pacific American Recognition Day, the Director presented the Special Emphasis Program Award for **Outstanding Asian/American Employee - Fort Myer Military Community** to Ms. Kumud Mathur.

Harvard University, Ford Foundation Award - Innovation in American Government Awards Competition 1997 Semi-Finalist:

Mr. Steven B. Siegel	Evaluation of Land Value Study (ELVS)

Individual Performance Awards. CAA leadership recognizes excellent performance through a robust awards program which even in lean times is used to promote productivity and quality by rewarding high personal achievement. The following awards were given in recognition of past performance and concomitant gains to CAA and the US Army, now and in the future.

Military Awards

Military Service Awards.	FY97
Army Achievement Medal:	1
Army Commendation Medal:	2
Meritorious Service Medal:	3
Legion of Merit:	0
Military Retirement Awards.	
Meritorious Service Medal:	2
Legion of Merit:	6
Total Military Awards:	14

Civilian Awards

Presidential Rank of Distinguished Executive:	1
Superior Civilian Service Award:	3
Commander's Award for Civilian Service:	3
Achievement Medal for Civilian Service Award:	5
Certificate of Achievement:	1
Quality Step Increase:	29
Performance Award:	61
Special Act Award:	8
On-the-Spot Cash Award:	11
Total Civilian Awards:	122

PUBLISHED ARTICLES AND REVIEWS

CAA emphasizes the importance of actively participating in the scientific advancement of operations research. In FY97 our technical staff had three articles in various stages of publication in refereed journals. They were:

Mr. Walter J. Bauman:

Ardennes Campaign Simulation (ARCAS), Military Operations Research, Vol. 2 - No. 4, 1996.

COL Andrew G. Loerch:

Learning Curves, Encyclopedia of Operations Research and Management Science, Kluwer Academic Publishers, Copyright 1996.

Finding an Optimal Stationing Policy for the US Army in Europe After the Drawdown, Military Operations Research, Vol. 2 - No. 4, 1996.

PUBLICATIONS PENDING

LTC Daniel Maxwell, with Dennis M. Buede: Composing and Constructing Value Focused Influence Diagrams: A Specification for Decision Model Formulation. Submitted to Management Science.

LTC Daniel Maxwell. What Every Good OR Analyst Should Know About Bayesian Networks. Submitted to Phalanx, October 1997.

Analysts have had their written critiques of operations research-related publications published. They are:

Reviewed by Dr. Charles Leake:

Managing Business Processes BPR and Beyond by C. Armistead and P. Rowland.

Strategic Risk: A State Defined Approach by J. M. Collins and T. W. Ruefli.

Applying OMT - A Practical Step-by-Step Guide to using the Object Oriented Modeling Techniques by K. W. Derr.

Korshunov AD (ed). - a collection of articles published by Kluwer Academic Publishers, 1996.

Requirements of Standards: Optimization Models and Algorithms by B. Goldengorin.

The Impact of Emerging Technologies on Computer Science and Operations Research; a collection of related articles edited by Stephen G. Nash and Ariela Sofer

Perspectives in Science and Technology: The Legacy of Omond Solandt; a collection of writings of many authors edited by C. E. Law, G. R. Lindsey and D. M. Grenvill.

CAA MANAGEMENT PLANNING CONFERENCES

6 November 1996, 19 February 1997, 30 April 1997, and 23 July 1997. As a Reinvention Laboratory it is incumbent upon CAA to always be looking toward the future for new and better ways of doing business. However, it is never enough to simply meet and espouse new goals and directions without having a means of following through on these intentions. As the Army's mission evolves into an era of uncertain resources and threats, a consequence of this uncertainty is the need to be innovative, creative, and bold in meeting the future head on. In this future are new types of thinking, analysis techniques, and customer demands requiring a CAA workforce prepared to meet these challenges.

- **CAA Organizational Evolution and Professional Development.** A featured topic of this year's management planning conferences was training. Training encompasses continuing education, professional gatherings, technological training, and any other means by which employees prepare themselves for future assignments.

Other special emphasis topics which were featured at this year's management planning conferences. were:

- **ADP Modernization;** wherein the problem of potential staffing shortfalls and possible consequences were discussed at length. Status reports on technological transfers from the current facility to the new building at Fort Belvoir were provided throughout the year.

- **Long Range Acquisition Scenarios;** mostly concerned with technology acquisition and the means to implement the various scenarios.

- **36th Army Operations Research Society Symposium (AORS XXXVI);** as the host for this annual event, progress reports were given at the last three conferences.

- **Major Force Planning Studies Updates**; as this year's dominant workload, planning sessions covering the gamut of the Quadrennial Defense Review studies all the way through the National Defense Panel composition were featured.

- **Agency Reorganization**; due to shifting workloads within the Agency and the introduction of Logistical Integration Agency (LIA) functions, the Director, CAA found it necessary to restruture certain functions within existing divisions and to form the Logistics Analysis Division.

- **Relocation to Ft. Belvoir.** The relocation of CAA to Ft. Belvoir is currently scheduled for 25 March 1999.

As in the past two years, each division chief briefed his/her management initiatives which will advance the cause of CAA as a Reinvention Laboratory.

SUMMARIES OF FY97 CAA ANALYTICAL EFFORTS

STUDIES

Army Force Planning Data and Assumptions - 2003 (AFPDA-03)

Compiles data needed for selected Army theater-level force planning studies; to assure validity or acceptability of the data by determining and applying appropriate procedures and rules for verification, consistency, and source documentation; to limit data to that which is unavailable from other sources. The POC for further information is Mr. Charles Tunstall, US Army Concepts Analysis Agency, DSN 295-6970.

Personnel Attrition Rates in Land Combat Operations, Phase 4 (PAR-P4)

Publishes a CAA Research Paper documenting and summarizing selected historical data on personnel losses of Army forces engaged in division and lower-echelon land combat operations, and planning for the conduct of Phase 5. The POC for further information is Dr. Robert Helmbold, US Army Concepts Analysis Agency, DSN 295-5278.

Support Force Requirements Analysis 2005 (SRA-05)

Conducts Phase II, Quantitative Analysis of Total Army Analysis FY 2000-2005 (TAA-05). Specifically, conducted campaign analysis of specified DPG-IS; deployability analysis of both the combat and total forces required; support force requirements analysis; and analyses to provide HQDA adequate information to effectively conduct resourcing phase. The POC for further information is LTC Stephen Peterson, US Army Concepts Analysis Agency, DSN 295-1688.

Statistical Analysis for the Land Disposal Restriction-Utah Group (STALDRUG)

Provides a statistical analysis to strengthen argument for CHPPM to use Army proposed values for EPA formula parameters rather than EPA defaults. These values are used to develop Land Disposal Restriction concentration levels for hazardous chemical agent waste in the state of Utah. The POC for further information is MAJ Patrick Dubois, US Army Concepts Analysis Agency, DSN 295-6931.

Strategic Lift Tradeoff (STRATLOFF)

This analysis examines the impact of augmenting the existing and planned US strategic airlift fleet, both military and civilian reserve air fleet (CRAF), with the new military outsize cargo deployment capable C-17 aircraft, and a civilian aircraft derivative called the non-developmental airlift aircraft (NDAA). The POC for further information is Ms. Vera Hayes, US Army Concepts Analysis Agency, DSN 295-1583.

Yearly Analysis of Techniques for Installation Readiness Prioritization (YATIRP)

Develops an analytic methodology using C-ratings to prioritize and evaluate environmental investment at Army installations within and across environmental media categories. The POC for further information is Mr. Steven Siegel, US Army Concepts Analysis Agency, DSN 295-5289.

QUICK REACTION ANALYSES & PROJECTS

SRA-05 Campaign Analysis (05CAN)

Analyzes and evaluates CEM outputs from SRA-05 campaign. Incorporates mobility and resource model outputs into analysis. The POC for further information is LTC(P) William Crain, US Army Concepts Analysis Agency, DSN 295-1581.

Authorization of CINC Assets to Requirements (ACAR)

This is a follow-on to the Cluster Analysis in Support of QDR(Dynamic Commitment). It assesses how well forces are allocated to OCONUS CINCs in terms of possible smaller scale contingency missions (SSCs). The POC for further information is Mr.

Duane Schilling, US Army Concepts Analysis Agency, DSN 295-1546.

Air Defense Artillery Force Structure Analysis-2005 (ADAFSA05)

Determines the threat-based Corps and Echelons Above Corps (EAC) ADA force structure required for the 2005 time frame to defend each of the CINCs defended asset priorities. Show risks to US forces and defended assets based on different levels of protection including the current force structure. The POC for further information is CPT William McLagan, US Army Concepts Analysis Agency, DSN 295-1652.

Prepare Memorandum Report documenting PHALANX articles (ADVReport)

Prepares CAA Memorandum Report documenting the series of PHALANX articles on the advantage parameter. The POC for further information is Dr. Robert Helmbold, US Army Concepts Analysis Agency, DSN 295-5278.

Air Force JCHEMRATES III Update (AF-JCHEM3-UP)

Updates personnel numbers for the Air Force in the JCHEMRATES III study for both MRCs. The POC for further information is CPT(P) Bonita Harris, US Army Concepts Analysis Agency, DSN 295-1263.

Alternative Force Structure (AFS)

Supports a viable DA force structure position on OSD alternatives to the POM, focused on meeting IPS objectives and annual Army procurement budget cap. Demonstrate doctrinally sound force structure alternative for acceptance by OSD & DA decision-makers. The POC for further information is CPT Kurt Bodiford, US Army Concepts Analysis Agency, DSN 295-5277.

Army Modernization Update-a Time-Constraint Problem - 1 (AMUCK)

Explores feasible modernization options involving the 40 enabling systems. This QRA will parameterize a number of the modernization variables (force structure modernized, funding levels, etc.) in an effort to identify robust relationships in the affordable set. The POC for further information is LTC Rodger Pudwill, US Army Concepts Analysis Agency, DSN 295-1609.

Army Modernization Update-a Time-Constraint Problem - 2 (AMUCK2)

Prepares for the QDR, exploration of feasible modernization options involving the 40 enabling systems. This QRA parameterizes a number of the modernization variables (force structure modernized, funding levels, etc.) in an effort to identify robust relationships in the affordable set. The POC for further information is LTC Rodger Pudwill, US Army Concepts Analysis Agency, DSN 295-1609.

Army Modernization Update-a Time-Constrained Problem - 3 (AMUCK3)

Determines the interrelationships among the major modernization projects in preparing for the QDR. In addition, determines the impacts of various production rates and modernization targets on the deployed combat force. The POC for further information is LTC Rodger Pudwill, US Army Concepts Analysis Agency, DSN 295-1609.

Army Modernization Update-a Time-Constrained Problem - 4 (AMUCK4)

Assists DAMO-FDX prepare for the upcoming QDR. DAMO-FDX has generated a "portfolio" approach to Army modernization and requires CAA to generate feasible implementations of the strategy. The POC for further information is LTC Rodger Pudwill, US Army Concepts Analysis Agency, DSN 295-1609.

Army Modernization Update-a Time-Constrained Problem - 5 (AMUCK5)

Assists DAMO-FDX prepare for the upcoming QDR. DAMO-FDX has generated a "portfolio" approach to Army modernization and requires CAA to generate feasible implementations of the strategy. The POC for further information is LTC Rodger Pudwill, US Army Concepts Analysis Agency, DSN 295-1609.

Army Modernization Update-a Time-Constraint Problem - 6 (AMUCK6)

DAMO-FDX has developed an "Information Dominance" strategy for Army Modernization. CAA

analyzed the resulting plan for programmatics, fleet age and combat power. The POC for further information is LTC Rodger Pudwill, US Army Concepts Analysis Agency, DSN 295-1609.

Anti-Personnel Land Mine Study (APLM)

Provides an analysis on the banning of non-self-destructing anti-personnel land mines and the impact of achieving military objectives in a theater simulation. The POC for further information is Ms. Harriet Lewis, US Army Concepts Analysis Agency, DSN 295-6959.

Anti-Personnel Landmine Study / NEA (APLM-NE)

Provides analysis of the effect of banning non-self destructing landmines (APLs) in the Korean Theater and its impact on achieving military objectives. The POC for further information is Ms. Louise Mclean, US Army Concepts Analysis Agency, DSN 295-5274.

Anti-Personnel Landmine Study #2 (APLM2)

Provides analyses on the banning of non-self destructing anti-personnel landmines and the impact of achieving military objectives in a theater simulation. Expand upon earlier QRA to include more tactical analysis. The POC for further information is Ms. Harriet Lewis, US Army Concepts Analysis Agency, DSN 295-6959.

ARCENT OPLAN (ARC-OPLAN)

Provides analytical support to ARCENT in Course of Action Development for the OPLAN. The POC for further information is MAJ David Bassett, US Army Concepts Analysis Agency, DSN 295-1708.

Advance Regional Exploratory System (ARES)

Develops new theater campaign simulation methodology by adding features of the Theater Exploration Study System (TESS) to the existing CAA Concurrent Theater Level Simulation (CTLS). A joint in-house and contractor (GRC & CSC) development effort. The POC for further information is Mr. Wallace Chandler, US Army Concepts Analysis Agency, DSN 295-1692.

Ardennes Fractional Exchange Ratio Research - Phase 1 (ARFERR-1)

Uses the Ardennes Campaign Simulation Database (ACSDB) to define and quantify relationships between Fractional Exchange Ratios (FER) and Initial Force Ratios (IFR) in historical battle results during the 1944-45 Ardennes Campaign. The POC for further information is Mr. Walter Bauman, US Army Concepts Analysis Agency, DSN 295-5261.

ATOMIUM 97 (ATOMIUM 97)

Determines NATO-PIP operational procedures for gathering and processing information; outlines necessary technical and tactical specifications for NBC equipment; determines the impact of implementing low-level operational exposure guidance (OEG); and evaluates crisis response and crisis management guidelines, procedures, and capabilities. The POC for further information is MAJ Gregory Perrotta, US Army Concepts Analysis Agency, DSN 295-1646.

Biological Casualty Assessment Study (BIOCAS)

Develops methodology that includes biological weapons effects and casualty estimation for theater level operation planning. Develop estimates for personnel casualties by biological effects in specified regional contingencies. Determines personnel, medical, and mortuary affairs support requirements based on regional contingency casualty estimations. The POC for further information is LTC Robert Launstein, US Army Concepts Analysis Agency, DSN 295-1684.

Theater Model Comparison (BRACKEN)

Performs a rigorous comparative review of the theater level combat simulations used in support of the PPBES process in the DoD. This includes the five key simulations: TACWAR, CEM, Thunder, JICM, and WORRM. The POC for further information is COL Andrew Loerch, US Army Concepts Analysis Agency, DSN 295-5259.

Breaking the Phalanx Exploration (BTP-EXP)

Creates a basis for analysis through modeling of the Revolution in Military Affairs (RMA) concepts proposed by LTC Douglas Macgregor in his book, "Breaking The Phalanx." Explores the merits of

changes to Army and Joint force structure in terms of combat effectiveness, deployability, and supportability. Provides sound analytical support for and identifies areas of concern in Macgregor's book to CSA. The POC for further information is LTC(P) William Crain, US Army Concepts Analysis Agency, DSN 295-1581.

C4ISRID Influence Diagram Model Construction (C4ISRID)

Evaluates the current technical quality of ongoing OSD effort to develop influence diagram based models of C4ISR in various theaters of operations. The POC for further information is COL Andrew Loerch, US Army Concepts Analysis Agency, DSN 295-5259.

Campaign Analysis - Chemical 2005 (CAC-05)

Conducts and analyzes theater simulation (Korea) to support development of the Army's Support Force Requirements. The campaign for this project is an excursion from the SRA-05. Specifically, this campaign includes adverse conditions (Chemical and no warning). The POC for further information is MAJ Mark Von Heeringen, US Army Concepts Analysis Agency, DSN 295-1677.

Campaign Analysis for Force XXI (CAF21)

Conducts and analyzes theater campaign results to assess impact of Force XXI Division design [Conservative heavy (CHD)] capabilities in NS-MRC E/W scenario. Compares this redesigned force with TAA05 force for operational effectiveness. The POC for further information is Mr. John Depalma, US Army Concepts Analysis Agency, DSN 295-5252.

Calculating Requirements for Deployment/Logistical Resources (CARDEALR)

Develops a model that graphically identifies shortcomings in key logistical resources during movement fluctuations of TF EAGLE's rotation in and out of Bosnia. The POC for further information is MAJ Patrick Dubois, US Army Concepts Analysis Agency, DSN 295-6931.

Review of CASCOM Logistic Planning Factors - Class V & VII (CASCOM LPF)

Reviews the CASCOM process and results to determine ways to improve the reliability and credibility of processes and results. The POC for further information is Mr. Gerald Cooper, US Army Concepts Analysis Agency, DSN 295-0529.

Campaign Analysis for Support Requirements Analysis 2005 (CASRA-05)

Conducts and analyzes theater simulation in support of developing the Army's Support Force Requirements to successfully support the DPG in a NS-MRC in 2005. The POC for further information is Mr. John DePalma, US Army Concepts Analysis Agency, DSN 295-5252.

Capabilities Based Munitions Requirements using WARREQ-03 (CBMR-WARREQ03)

Provides WARREQ-03 data by target category of the Outyear Threat Report, which requires extensive changes to the CALAPER model. The POC for further information is Mr. David Williams, US Army Concepts Analysis Agency, DSN 295-1593.

Costs of Alternative Forces in Bosnia (COAFIB)

Estimates the variations in costs for alternative peacekeeping force structures for Bosnia generated by the Talking Fish 97 Political/Military Game. The POC for further information is Mr. Joel Gordon, US Army Concepts Analysis Agency, DSN 295-0450.

CENTCOM Operational Fires (COF-OF)

Provides CINC, USCENTCOM with analysis of OPLAN incorporating the recently developed Planning Tool for Operational Fires (PTOF). The POC for further information is MAJ David Bassett, US Army Concepts Analysis Agency, DSN 295-1708.

Comparison of DAWMS and 2 Other Analyses (COMP-D2X)

Compares Deep Attack/Weapons Mix Study (DAWMS) with Support Requirements Analysis 2003 (SRA-03), and Decision Support Modeling IV (DSM IV) modeling results, focusing on the effects

of Combined Forces Command (CFC) air during the force generation phase of the campaign. The POC for further information is MAJ Thomas Kastner, US Army Concepts Analysis Agency, DSN 295-1654.

Combined Forces Command Operations Plan 1998 (COP98)

Provides analyses of the dual MRC scenario with updated assumptions, conditions, friendly and enemy orders of battle and campaign concepts (including adverse enemy actions) to the United States Forces Korea (USFK) in their effort to update their OPLAN. The POC for further information is MAJ(P) Bill Walk, US Army Concepts Analysis Agency, DSN 295-5300.

CFC Operations Plan 98 - High Chem (COP98-HI)

United States Forces Korea (USFK) staff is initiating work to update their OPLAN. This effort looks at the dual MRC scenario with updated assumptions, conditions, friendly and enemy orders of battle and campaign concepts. The POC for further information is MAJ(P) Bill Walk, US Army Concepts Analysis Agency, DSN 295-5300.

CFC Operations Plan 98 - Low (COP98-LOW)

United States Forces Korea (USFK) staff is initiating work to update their OPLAN. This effort looks at the dual MRC scenario with updated assumptions, conditions, friendly and enemy orders of battle and campaign concepts. The POC for further information is MAJ(P) Bill Walk, US Army Concepts Analysis Agency, DSN 295-5300.

CFC Operations Plan 98 - High Chem (COP98-VAR)

United States Forces Korea (USFK) staff is initiating work to update their OPLAN. This effort looks at the dual MRC scenario with updated assumptions, conditions, friendly and enemy orders of battle and campaign concepts. The POC for further information is MAJ(P) Bill Walk, US Army Concepts Analysis Agency, DSN 295-5300.

J8 Request for COSAGE Combat Samples (COS-J8)

Provides COSAGE Posture Average output file (developed for the TAA 2005 Study) to J8 for update of MRC-W and MRC-E ground attrition data of TACWAR version 5.0. The POC for further information is Mr. Charles Bruce, US Army Concepts Analysis Agency, DSN 295-6936.

TAA05 COSAGE Data for OSD-SLOC (COS-SLOC)

Compiles SRA-05 SWA combat samples for use in OSD's Sea-Lines of Communication (SLOC) effort. The POC for further information is Mr. Charles Bruce, US Army Concepts Analysis Agency, DSN 295-6936.

USAF Request for TAA 2005 COSAGE Data (COS-USAF)

Provides the RALPH processed COSAGE data for both Northeast Asia and Southwest Asia (developed by TAA 2005) to the Air Force Studies and Analysis Agency for use in the THUNDER model. The POC for further information is Mr. Charles Bruce, US Army Concepts Analysis Agency, DSN 295-6936.

Casulty Rates Data for Soldier Support Institute (CRD-SSI)

Develops sets of battle casualty rates and disease and nonbattle injury (DNBI) rates for use in the LPXMED model. This model is used in battlefield training exercises to allow commanders to estimate personnel losses and replacement requirements. The POC for further information is Mr. Stanley Miller, US Army Concepts Analysis Agency, DSN 295-5292.

Casualty Rates Data for Total Army Personnel Command (CRD-TAPC)

Develops battlefield casualty rates and disease and nonbattle injury (DNBI) rates data for distribution to Army activities, and as input to the Casualty Estimation Steering Committee (CESC) database. The POC for further information is Mr. Stanley Miller, US Army Concepts Analysis Agency, DSN 295-5292.

Deep Attack Weapons Mix Study Support - WORRM Model (D-WORRM)

Supports the Army Staff in assuring the mathematical programming models employed in the Deep Attack Weapons Mix Study credibly represent Joint and Army objectives. The POC for further information is COL Andrew Loerch, US Army Concepts Analysis Agency, DSN 295-5259.

Decision Analysis for MTMC Site Alternatives (DAMSA)

Develops model to rank alternative CONUS Army installations by scores using Logical Decisions for Windows. Conducts decision analysis in support of the realignment of Military Management Traffic Command (MTMC) CONUS Headquarters (HQ) to an Army installation with available capacity. The POC for further information is Mr. Joel Gordon, US Army Concepts Analysis Agency, DSN 295-0450.

DAWMS Scaling Factors (DAWMS (SF))

The theater-level combat simulation, TACWAR uses data that appears to use a set of arbitrary inputs. CAA analyzes the extent to which these are used, and their implications in the DAWMS analysis. The POC for further information is COL Andrew Loerch, US Army Concepts Analysis Agency, DSN 295-5259.

DAWMS Helicopter Sortie Excursion (DAWMS-HS)

Determines the effects of limiting the sortie rates for deep range bands in the WORRM model. The POC for further information is Ms. Linda Coblentz, US Army Concepts Analysis Agency, DSN 295-6974.

DAWMS Logistics Excursion (DAWMS-LOG)

Determines the feasibility of the logistics assumptions used for the baseline case of the DAWMS study. The factors are limited to POL and PGMs. The POC for further information is COL Andrew Loerch, US Army Concepts Analysis Agency, DSN 295-5259.

Degrade Risk Matrix (DRM-I)

Provides the range of possible outcomes based on variations in: amount of degradation, length of time of degradation, speed of recovery, and capability to recover; examine multiple combinations of degradation and recovery to operations when disrupted by both conventional and chemical weapons. The POC for further information is Mr. Karsten Engelmann, US Army Concepts Analysis Agency, DSN 295-1501.

Decision Support Modeling (Resource Constrained) (DSM-RC)

This is a continuation of operations analysis done for the United States Force Korea (USFK) staff. This effort looks at the CFC OPLAN when Korea is the second of two MRCs and given the resource constraints of the integrated TPFDD. The POC for further information is COL Rodger Knox, US Army Concepts Analysis Agency, DSN 295-5267.

DSM IV - Reception, Staging, Onward Movement & Integration (DSM-RSOI)

Compares two OPLANs and determines the difference in the flow of Combat Service Support (CSS) units. Revises the chemical degradation figures for the Ports of Debarkation (PODs), and assesses the impact on the flow of forces. The POC for further information is LTC Rubye Braye, US Army Concepts Analysis Agency, DSN 295-1296.

Expediting the SWA Counteroffensive (ECI-SWA-97)

Compares the value of additional Precision guided Munitions (PGM) with the value of additional POMCUS (enough for one division) in expediting the counteroffensive in a war in Southwest Asia. The POC for further information is Mr. Martin Dwarkin, US Army Concepts Analysis Agency, DSN 295-1663.

Economic Failure Based Upon Albania Lessons Learned (EFBALL)

Identifies the economic factors that may have contributed to the disintegration of the Albanian state. Once these factors were identified, data from other countries in Eastern Europe and sub-Sahara Africa was collected and examined for trends

similar to the Albanian experience. This analysis may highlight the potential for instability in the selected set of examined countries. The POC for further information is Mr. Duane Gory, US Army Concepts Analysis Agency, DSN 295-6953.

EN Support to Decision Support Modeling IV Follow up (EN-DSM IV)

This is a follow up study done in conjunction with OCA-NEA for the United States Forces Korea (USFK) staff. This effort looks at a MRC scenario with updated assumptions and conditions, including adverse conditions. The POC for further information is CPT Matthew Chesney, US Army Concepts Analysis Agency, DSN 295-1503.

Exercise Roving Sands 1997 (EXERS97)

Provides the command, Army Central Command (ARCENT) with independent modeling and analysis for Exercise Roving Sands 1997. The modeling of Tactical Ballistic Missile (TBM) defense in the APAB-PI model will be aggregated into the Concepts Evaluation Model (CEM). The POC for further information is CPT William McLagan, US Army Concepts Analysis Agency, DSN 295-1652.

Force Augmentation Options 98 (FAO)

Investigates various force augmentation options under the adverse influence of the introduction of chemical effects into the warfight. The POC for further information is MAJ Thomas Kastner, US Army Concepts Analysis Agency, DSN 295-1654.

Fleet Age Recapitalization - System Input Data Excursions (FAR SIDE)

Evaluates the long-range impact the current POM will have on the Army's inventory of armored, communications, helicopter, self-propelled artillery, and tactical wheeled vehicle systems and determines the cost of maintaining systems beyond the end of their refit, or retire (R3) points when the production base is unable to replace them. The POC for further information is Mr. Neal Siegel, US Army Concepts Analysis Agency, DSN 295-5255.

Force XXI Echelon Above Division Design Evaluation Excursion (FEDEX)

As part of the Army's Force XXI redesign initiative TRADOC is considering a proposal to reorganize EAD administration and logistical functions and organizations under a theater army support command and recast the corps as an operational command and control headquarters. Assists TRADOC by analyzing the total strength for a theater army organized under the proposed structure. The POC for further information is Mr. George Stoll, US Army Concepts Analysis Agency, DSN 295-2088.

GDAS Model Comparison (GDAS-MCOM)

Performs deployment analysis using GDAS and compare against TRANSMO generated SRA-03 results to serve as a baseline for using GDAS in the test process. In addition, uses the comparative analysis as supporting material in the Director's GDAS accreditation proposal. The POC for further information is Dr. Elizabeth Abbe, US Army Concepts Analysis Agency, DSN 295-0027.

Health Assessment Risk - PERICLES Improvement (HARPI)

Develops method to assess the public health challenges facing each nation and each country's capabilities to respond to a Presidential Decision Memorandum. Method will be used to enhance the Army's ability to evaluate the risk of instability in foreign countries as a result of public health situations in those countries. The POC for further information is Mr. Robert Solomonic, US Army Concepts Analysis Agency, DSN 295-6905.

Heavy Division Impact (HEADI)

Determines the impact of deploying two additional reserve heavy divisions (NG) and associated CS/CSS slice to MRC-East at various times in the deployment, for West-East MRC scenario. In addition, determines the impact on other major forces' arrivals, given these units have priority of movement. The POC for further information is Ms. Margaret Loudin, US Army Concepts Analysis Agency, DSN 295-1657.

Imbedded vs. Applique Mix of SEP (IAMSEP)

Determines the best mix of M1A1D and M1A2 SEP within a division set. The POC for further information is LTC Rodger Pudwill, US Army Concepts Analysis Agency, DSN 295-1609.

Information Warfare Simulation (IWSIM)

Assists DISA in the construction of an Information Warfare (IW) training simulator and determines whether the DISA IW training simulator offers calibration data and algorithms for the simulation of IW in a theater combat model. The POC for further information is Mr. John Shepherd, US Army Concepts Analysis Agency, DSN 295-1643.

JPACS Phase I KIDA Chem-Bio Issues Workshop (JPACS-IW)

Identifies chemical-biological threats in NEA and determines protection measures. Examines alternative military security enhancements to cope with emerging chemical-biological threats on the Peninsula. The POC for further information is MAJ Mark Zamberlan, US Army Concepts Analysis Agency, DSN 295-5269.

Logistical Support to Counteroffensive (LSC)

Assesses the capabilities and constraints of the Korean Logistical network to adequately support the counteroffensive. The POC for further information is Mr. Richard Poulos, US Army Concepts Analysis Agency, DSN 295-1625.

MARTYR Doing Other Matches (MARTYRDOM)

Assesses MARTYR's capability to perform Agency force matches by comparing with SRA-03 results. Modifies MARTYR to perform identified additional requirements. Replicate current output formats from various match routines from FASTALS and CAMP. The POC for further information is Mr. Barry Groves, US Army Concepts Analysis Agency, DSN 295-6965.

Measuring Ethnic Religious Communal Stress, Sub-Sahara (MERCS-SSA)

Develops analytic methods to assess the stressors facing each state from ethnic and religious groups, and the capabilities of each state to respond. The method will be used to enhance the US Army's ability to evaluate the risk of instability in foreign states in order to identify and respond to countries facing potential crises. The POC for further information is Mr. Robert Solomonic, US Army Concepts Analysis Agency, DSN 295-6905.

Managing Research in Environmental Decision Making II (MRED II)

Applies the methodology developed in the prior MRED QRA to measure and analyze the economic return of a set of Army R&D projects to be submitted for funding under the DOD Environmental Security Technology Certification Program (ESTCP) for FY98. The POC for further information is Mr. Steven Siegel, US Army Concepts Analysis Agency, DSN 295-5289.

New Methodology for Combat Support Companies (NEWMEC)

Analyzes the potential impact on Military Police force structure for TAA-05 using newly developed allocation rules. Assists the sponsor in determining the resourcing requirements for Combat Service Companies. The POC for further information is Mr. Giles Mills, US Army Concepts Analysis Agency, DSN 295-1630.

New Mask Concept for JCHEMRATES III (NMC-JCR3)

Provides an estimate of how many of the new masks would be consumed or expended in a wartime scenario. The POC for further information is CPT(P) Bonita Harris, US Army Concepts Analysis Agency, DSN 295-1263.

Objective Force Planning - Workshop #1 (OFP-I)

Implements the first of two planned workshops. Identifies regional tasks in support of the National Military Strategy, and defines objectives, UJTL tasks

and corresponding Mission Task - Organized Forces (MTOF) for each regional task. The POC for further information is MAJ Steven Aviles, US Army Concepts Analysis Agency, DSN 295-5291.

Objective Force Planning - II (OFP-II)

Implements the second of a series of workshops to identify missions, objectives, UJTL tasks, and associated force requirements in support of the National Military Strategy. The POC for further information is MAJ Steven Aviles, US Army Concepts Analysis Agency, DSN 295-5291.

P2 Investment Strategies in Support of 98-03 POM (P2POM)

P2POM uses the PAPA/PERSEUS methodology to generate a set of prioritized pollution prevention investment strategies in support of the Emergency Planning and Community Right-to-Know (EPCRA) guidance with respect to toxic release reduction and manifested waste disposal. The strategies prescribe the types and quantities of pollution prevention (P2) projects to be funded by FY and MACOM. The POC for further information is Mr. Steven Siegel, US Army Concepts Analysis Agency, DSN 295-5289

Planning Future Military Forces (PFMF)

Presents documentation of the Army's evolving force planning processes in both briefing and issue paper format. Shows that this planning process can and should be adopted as a Joint Planning Process. This QRA describes a disciplined joint framework for linking force strategy, requirements and resources. The POC for further information is Mr. Daniel Shedlowski, US Army Concepts Analysis Agency, DSN 295-1532.

Phased Offline Attrition (POLA)

Examines the logistics demands for the air campaign in the Republic of Korea (ROK) and the additional demands increased sortie generation rate will place upon the logistics system. Examines the reductions at key air bases; and performs in-depth examination of the phased off-line attrition (POLA) analysis and air component command (ACC) analysis. The POC for further information is Ms. Linda LaBarbera, US Army Concepts Analysis Agency, DSN 295-5301.

Premobilization Sensitivity Analysis (PREMOB-SA)

Determines sensitivity of two key factors - cargo facility capacity and vehicle availability; and using GDAS, assists in defining the Republic of Korea's requirement to support intra-theater movement of initial slice of Time-Phased Force Deployment List (TPFDL). The POC for further information is COL Rodger Knox, US Army Concepts Analysis Agency, DSN 295-5267.

Partnership for Peace & NATO/MED Working Party Pol-Mil Game (PRISM-97)

Documents a political-military game to examine Nuclear, Biological, and Chemical (NBC) medical capabilities, coordination, and challenges facing NATO and Partnership for Peace countries. Game dates: 6-8 Feb 97. The POC for further information is MAJ Gregory Perrotta, US Army Concepts Analysis Agency, DSN 295-1646.

Planning Tool for Operational Fires (PTOF)

Develops a methodology/tool to allow for the modeling and execution of Operational Fires; then assesses the current effects of operational fires on the courses of action planned for Roving Sands 97. The POC for further information is CPT William McLagan, US Army Concepts Analysis Agency, DSN 295-1652.

QDR I - Dynamic Commitment (QDR I-DC)

Analyzes multiple simultaneous missions over an eight year time period to determine Army force structure shortfalls. The POC for further information is MAJ Steven Aviles, US Army Concepts Analysis Agency, DSN 295-5291.

QDR I - Dynamic Commitment Revisited (QDR I - DCR)

Analyzes multiple simultaneous missions over a seven year time period to determine Army force structure shortfalls. Determines the effect (shortfalls) each small scale contingency (SSC) will have on the forces required for the first 30 days of the first Major Theater War (MTW). The POC for further information is MAJ Steven Aviles, US Army Concepts Analysis Agency, DSN 295-5291.

QDR Force Assessment (QDR-FA)

Provides a force assessment and suitable force alternative to the OSD Forces Assessment Alternatives. Uses both TACWAR and CEM models to develop a feasibility region for use in first order assessments of force structure draw downs. Incorporates MTOF alternatives for comparative purposes. The POC for further information is LTC(P) William Crain, US Army Concepts Analysis Agency, DSN 295-1581.

Quadrennial Defense Review - II Cluster Analysis (QDR-II CA)

Performs Cluster Analysis to determine and/or validate missions chosen for Simultaneity Stacks; determines groups of CINC missions by MTOF capability. The POC for further information is Mr. Duane Schilling, US Army Concepts Analysis Agency, DSN 295-1546.

QDR Force - Risk Analysis (QDRF-RA)

Provides a risk assessment of OSD Forces Assessment Alternatives, the extended POM, and the CAA developed CINC force. Uses TACWAR and existing JCS analysis as the starting point for the risk assessment. The POC for further information is LTC(P) William Crain, US Army Concepts Analysis Agency, DSN 295-1581.

Quadrennial Defense Review Long Range - Deployment Analysis (QDRLR-DA)

Determines the force flow for major Army forces deployed to a single European destination in FY2016, and compares with the postulated or sponsored estimated closure profile. The supporting analysis assists DCSOPS in submitting Army force closure objectives to OSD. The POC for further information is Ms. Margaret Loudin, US Army Concepts Analysis Agency, DSN 295-1657.

Roving Sands 97 (RS97)

Provides Commander, ARCENT with a deployable, highly responsive analytical package for Exercise Roving Sands 97. The package includes the Theater Ballistic Missile (TBM) model developed by EAD. The POC for further information is MAJ David Bassett, US Army Concepts Analysis Agency, DSN 295-1708.

Support to the Army Audit Agency's Land Acquisition Analysis (SAAALAAA)

ACSIM requested the Army Audit Agency to investigate training land acquisition. The RCTIFYRS model developed for use in BRAC 95 is run to provide data on alternative training sites near the proposed acquisitions. The POC for further information is LTC Rodger Pudwill, US Army Concepts Analysis Agency, DSN 295-1609.

Survey of Army Mobility: Strategic Operations, Nat'l Infras, Tech & Equip (SAMSONITE)

Determines the affect that Army Strategic Mobility Project initiatives will have on the unit closure times. The POC for further information is Ms. Patricia Murphy, US Army Concepts Analysis Agency, DSN 295-0211.

Simulation Enhancements from Ardennes Campaign Analysis (SEACA)

Investigates the potential enhancements to the Concepts Evaluation Model (CEM) suggested by the results of the Ardennes Campaign analyses conducted by CAA. Determines the suitable logic for such enhancements; implements and tests enhancements; compares enhanced simulation results with Ardennes Campaign results. The POC for further information is Dr. Ralph Johnson, US Army Concepts Analysis Agency, DSN 295-1542.

STOCEM Investigation of COSAGE Sampling (SICS)

Examines methods for using ARCAS COSAGE samples in STOCEM. This RAA executes STOCEM with several different stochastic sampling techniques applied to the COSAGE samples used in ARCAS, and compares average STOCEM outcome results & ranges of outcome variation. Results guide the use of COSAGE samples in KOSAVE. The POC for further information is Mr. Walter Bauman, US Army Concepts Analysis Agency, DSN 295-5261.

Saudi Military OR Training (SMOR)

Provides the Saudi General Staff with introductory level training on basic OR techniques and issues. The POC for further information is COL Andrew Loerch, US Army Concepts Analysis Agency, DSN 295-5259.

SRA-05 Share of Kill Comparison: CAA & CENTCOM (SOKCOM)

Compares the CAA and the CENTCOM projected share of enemy target kills for a specific OPLAN. Comparison is by major weapon systems for both the East to West and West to East scenarios using the near simultaneous DPG IPS. Study shows percentages and numerical allocations to target kills, as compared with CENTCOM published results. The POC for further information is Mr. Chester Jakowski, US Army Concepts Analysis Agency, DSN 295-5233.

SRA-05 Deployment Analysis (SRA-05 DA)

Develops Army movement requirements for selected DPG 99-05 scenarios and performs strategic deployment analyses using these forces within the context of individual scenarios. Results are provided in format useful for campaign analyses to support the SRA-05 Study. The POC for further information is Ms. Margaret Loudin, US Army Concepts Analysis Agency, DSN 295-1657.

SRA-05 Deployment Analysis / Base Case (SRA-05 DA/BC)

Develops Army movement requirements incorporating the new support structure based on TAA-05 allocation rules for East & West DPG 98-03 Major Regional Contingency (MRCs) scenarios. Performs strategic deployment analysis within the context of specified MRCs. The POC for further information is Ms. Margaret Loudin, US Army Concepts Analysis Agency, DSN 295-1657.

SRA 2005 - Deployment Analysis - LRC/MRC (SRA-05 DA/LM)

Conducts a strategic mobility analyses to determine the capability of the strategic lift system to deliver the force required to support the combat forces in the Limited Regional Contingency followed by Major Regional Contingency (LRC/MRC) scenario of FY1998-2003 Defense Planning Guidance, Illustrative Planning Scenario. The POC for further information is Ms. Margaret Loudin, US Army Concepts Analysis Agency, DSN 295-1657.

SRA 05 Early Counteroffensive Excursion (SRA05 EC)

Identifies the conditions under which an early counter offensive might be conducted in the TAA 05 Southwest Asia MRC. Determines the expected outcome should such an operation be conducted. The POC for further information is LTC(P) William Crain, US Army Concepts Analysis Agency, DSN 295-1581.

Transportation Analysis (TA)

Determines the force structure required to conduct a Peace Enforcement mission when a light brigade, a light division headquarters, and an assault lift battalion are added to the primary force structure. The POC for further information is MAJ Steven Aviles, US Army Concepts Analysis Agency, DSN 295-5291.

Total Army Analysis Chemical Excursion, East MRC (TAA CHEM E)

Provides effects of chemical warfare, to include delivery by tactical ballistic missiles, to support the theater campaign analysis of MRC East being performed for the Total Army Analysis (TAA) Adverse Cases for the two MRC scenario. The POC for further information is CPT Matthew Chesney, US Army Concepts Analysis Agency, DSN 295-1503.

Total Army Analysis Chemical Excursion, West MRC (TAA CHEM W)

Provides effects of chemical warfare, to include delivery by tactical ballistic missiles, to support the theater campaign analysis of MRC West being performed for the Total Army Analysis (TAA) Adverse Cases for the two MRC scenario. The POC for further information is CPT Matthew Chesney, US Army Concepts Analysis Agency, DSN 295-1503.

TAA05 Wartime Executive Agent Responsibility (TAA05 WEAR)

Determines the Army force structure required to conduct support to other US military services under formal Wartime Executive Agent Responsibility (WEAR) directives. As a major excursion, calculates the Army force needed to provide nuclear/chemical/biological decontamination support to other US military services in each theater

of operations. The POC for further information is LTC Richard Kearney, US Army Concepts Analysis Agency, DSN 295-5294.

TACWAR Support to DAWMS Effort in NE (TACWAR-NEA)

Documents support to the Army Staff using the TACWAR combat model as participants in the Deep Attack/Weapons Mix Study (DAWMS) analysis. The POC for further information is Mr. Louis Albert, US Army Concepts Analysis Agency, DSN 295-1580.

TAEBAEK 97 Political/Military Game (TAEBAEK 97)

Identifies chemical-biological deterrence and mobilization options. Determines readiness issues to defend against chem-bio weapons. Assesses regional defensive strategies against chem-bio warfare. Examines post-conflict chemical-biological requirements. Examines CWC's and BWC's utility for chem-bio protections. The POC for further information is MAJ Mark Zamberlan, US Army Concepts Analysis Agency, DSN 295-5269.

Theater Analysis for FXXI (TAF21)

Conducts theater-level analysis of all three FXXI division design alternatives. Develops operational & logistical CONOPS to employ for modeling. Develops a fully defined SWA theater force for the conservative heavy design (CHD). Compares defined SWA theater with TAA 05 SWA theater force. Analyzes strategic deployment requirements and compare the operational effectiveness for all three division designs. The POC for further information is MAJ Steven Aviles, US Army Concepts Analysis Agency, DSN 295-5291.

TALKING FISH 97 Political/Military Game (TF97)

Examines and assesses alternative strategies to achieve SFOR transition; assess TFOR variants, EFOR and ZFOR capabilities and characteristics; determines and validates US strategic objectives in B-H; forecasts impact on future trans-Atlantic security relations. The POC for further information is LTC Reid Trummel, US Army Concepts Analysis Agency, DSN 295-6992.

TACWAR Installation and Modification (TIM)

Installs current version of TACWAR Theater Campaign simulation model now used throughout the DoD in the conduct of Joint analyses, and makes it fully operational for use at CAA. Modifies model to make it congruent with the version in use by Joint Staff for DAWMS & QDR studies, corrects bugs, and modifies ATCAL. The POC for further information is Mr. John Warren, US Army Concepts Analysis Agency, DSN 295-1690.

The "New Paradigm" (TNP)

Learn about the Rand Project Air Force models and analyses that are supporting the recent publicity concerning the need for significantly fewer ground forces. The POC for further information is COL Andrew Loerch, US Army Concepts Analysis Agency, DSN 295-5259.

Transportation Structure Sensitivity to TAA03 Stockage (TS2TS)

Conducts TAA-03 FASTALS excursions with changes in stockage policies to determine transportation force structure sensitivity to stockage levels. The POC for further information is MAJ Pamela Leonowich, US Army Concepts Analysis Agency, DSN 295-0270.

Wartime Requirements - FY03 Chemical (WARREQ-03C)

Reruns the Equipment Loss Consolidator for the WARREQ-03 study, using the updated master LIN list in coordination with the EAD/NBC division's Chem-Rates process. The POC for further information is MAJ Jerry Glasow, US Army Concepts Analysis Agency, DSN 295-1617.

Warfight Sustainability Report (APCs) (WSR-APC)

Evaluates the Warfight Sustainability Report for APC Class V and VII; and identifies potential problems and improvements. This QRA is done in conjunction with operational analysis of the new OPLAN. The POC for further information is Mr. Richard Poulos, US Army Concepts Analysis Agency, DSN 295-1625.

Warfight Sustainability Report (Mortar)
(WSR-M)

Evaluates the Warfight Sustainability Report for Anti-Tank/Mortar Class V and VII; and identifies potential problems and improvements. This QRA is done in conjunction with operational analysis of the new OPLAN. The POC for further information is Mr. Richard Poulos, US Army Concepts Analysis Agency, DSN 295-1625

TECHNOLOGY RESEARCH AND ANALYSIS SUPPORT

TECHNOLOGY RESEARCH

General. CAA's Advanced Research Projects Office (ARPO) has a threefold mission: to identify and evaluate advanced technologies and methodologies for potential applicability to the CAA mission; to provide consultation on advanced technology subjects and methods; and to develop and execute an applied research program. ARPO's mission is to find and import useful technology. During FY97, ARPO pursued a variety of exploratory and developmental efforts to apply new and emerging technology to CAA's study, analysis, and QRA processes. The major projects and activities are summarized below.

Preservation of Statistical Properties of Data Among and Across Military Models and Simulations. Dr. Y.C. Ho (Harvard) and Dr. Wubei Gong (University of Massachusetts-Amherst) continued research on ways to transfer target allocation and attrition data from division level combat simulation samples to theater level modeling. By the end of FY97, Dr. Gong successfully extended his method for "path bundling," to higher dimensioned state and path spaces and established the de facto equivalence of the bundling rules to operations on intra- and inter-bundle distance metrics. The ongoing research includes interpretation of all the quantities and steps in the bundling process. The approach, like many others, implies a need for data that span the state and path spaces of interest. Generation of sufficient data is not part of the research and remains the single most serious obstacle to practical application.

Combat Simulation Trajectory Management. Dr. Gilmer (Wilkes University) continued research on the applicability of "multitrajectory simulation techniques" to force-on-force combat simulations. Multitrajectory simulation follows two or more outcomes of a random event, instead of only a single outcome determined by chance as is the usual practice for a single replication of a stochastic simulation. Gilmer's method follows and preserves many trajectories or paths and their associated probabilities through simulation state space. The primary challenge is controlling and constraining the potential combinatoric explosion by a managed sampling approach. Dr. Gilmer began work to refine trajectory management but was slowed during prolonged recuperation from a serious traffic accident. He did participate in the ARO/CAA workshop on analytic combat modeling and Simulation in March 1997.

ATCAL Representation of Area Fire. In February 1997, ARPO began research on the representation of area fire in ATCAL, CAA's method for extending the results of standard high resolution engagements from COSAGE modeling to the thousands of non-standard (in the sense of different numbers of engaged systems and different unit frontages) engagements that arise in full length theater campaign analyses with, e.g., CEM. ARPO identified many circumstances under which the relations among engaged systems and unit frontages appear correct. ARPO also discovered several deviant cases. Most of these appear easily correctable. However, a strange set of cases remains unexplained. The research has required development of several special tools for numeric and symbolic display and analysis. Phase I research through the end of FY97 was largely diagnostic. Phase II, to begin early in FY98, is to provide corrective actions.

Comparison of Representations of Target Allocation and Attrition. Early in 1997, Professor James Taylor (Naval Postgraduate School) undertook an objective comparison of long-standing approaches to modeling the allocation and attrition of targets as embedded within Johnsrud's (CAA) ATCAL, Anderson's (IDA) Anti-Potential Potential, and Bonder's and Farrell's (VRI) methods. Emphasis was to be on notions of "standard engagements" and scaling or extrapolation to the myriad non-standard engagements that arise during full length theater campaigns. Prof. Taylor is to complete his work early in FY98.

High Performance Computing (HPC). CAA, a remote site for the Army High Performance Computing Research Center (AHPCRC), coordinated work on the portability and performance of CAA's simulation and optimization models. Dr. Kosmo Tatalias continued his assignment as CAA's on-site AHPCRC representative. His involvement in a variety of modeling and computing initiatives

included careful study of the details of ARPO's research on ATCAL's representation of area fire and related issues.

Artificial Intelligence (AI) and Lisp-Related Activities. The application and promotion of AI technology is a long-standing ARPO goal.

AI Specialty Program for Civilians. Ms. Judith Bundy completed work to establish an AI Specialty Program for Army civilians. The program recognizes specialized individual skills and helps the Army meet its growing AI needs. The effort supports National Performance Review initiatives, improves workforce skills targeted to the Army Information Warfare Mission, and increases opportunities for networking and technology transfer throughout the Army AI community.

COSAGE Toolkit. A cooperative knowledge engineering, software development and relational database effort among several CAA divisions continued by integrating a suite of existing and emerging software tools. ARPO and the USAAIC completed development and began testing a GUI-based system (CDMS II) to define, build, and check model ready input to COSAGE. The need to rework parent data bases delayed initial operability of the system to the end of 1997.

Expert Systems Course. In August, CAA hosted a two-week on site course funded by the USAAIC for Army-wide participation.

Weather Sequencing in CEM. Standard CAA practice has been to operate the CEM theater campaign analysis model in a steady-state weather flight mode. Dr. Y.Y. Chen examined representative real weather sequences and proposed application of a Markov chain approach to introduce conditional, time-dependent variation in CEM's air operations.

Access to AGCCS. Over two years ago, CAA decided that it would be beneficial to achieve direct access to the Army Global Command and Control System. Ms Bundy coordinated meeting milestone after milestone and requirement after requirement (several of which arose unexpectedly) to provide CAA analysts with training, passwords, and a desktop workstation with CAA as the Army's first remote site.

Visualization. With SIMTECH support, ARPO continued to expand CAA's visualization capabilities with emphasis on helping analysts "see and understand results." Throughout FY97, ARPO worked with selected CAA action teams to design, develop, and implement useful static and dynamic display routines. ARPO continued to rely heavily on Wolfram Research's Mathematica, embedded within CAA's distributed analyst workbench. Visualization tasks can be performed on Macintosh, Windows, and Unix computers, including laptops in the field. Users themselves do much of the work and export displays for use in customer presentations.

ARO/CAA Workshop. On March 10-11, 1997, the Army Research Office and CAA co-sponsored a workshop on "Analytic Combat Modeling and Simulation." The workshop consisted of 14 invited talks and two panel discussions. ARO published proceedings of the workshop.

Consultation.

Logistic Planning Factors. ARPO completed a review of the logic and content of the process by which CAA and CASCOM generate logistic planning factors (lbs/man/day) for use in CAA's SRA05 and other analyses. Work and results are reported in CAA-MR-96-79.

Theater Missile Defense. ARPO provided an appendix to CAA's report on the FY96 LOTSA-MSLS analysis. The appendix describes the hierarchical dynamics programming algorithm developed and applied during the analysis.

Statistical Analysis Support. ARPO's Dr. Y. Y. Chen continued to provide agency-wide support in experimental design and statistical analysis. Dr. Chen conducted research on non-parametric estimation techniques.

METHODOLOGY RESEARCH

General. CAA uses a wide variety of simulations, models, and special purpose Information Technology (IT) systems to accomplish its study program. These tools, often referred to collectively as models, range from simple spread sheets and data processing systems to complex simulations of theater combat. The following paragraphs describe major accomplishments in our continuing program of methodology development and enhancement.

Development Efforts:

Advanced Regional Exploratory System (ARES). This regional theater campaign simulation model development effort continues work begun initially under the Concurrent Theater Level Simulation (CTLS) development program. Specifically, ARES has evolved as a merger of the CAA developed CTLS and the Theater Exploitation Study System (TESS) model developed for the U.S. Army INSCOM, Studies and Analysis Activity (SAA). The ARES design provides for an event sequenced, object oriented structure with the capability to represent regional conflicts in a combined, joint and coalition context, ranging from full scale theater operations to lesser regional contingencies. ARES brings together the intelligence, communications and information warfare simulation features of TESS with the flexible regional campaign representation capability of CTLS. This flexibility is realized through a user-specified maneuver network which allows adaptable representation of maneuver warfare and a robust command and control process, with both user-scripted and rule-based decisions, which permits user control of the phased execution of an operations plan. The simulation is under close user control through the exercise of a robust and extensive Graphical User Interface (GUI). The design work for ARES began in late FY95, with the objective of producing a first prototype version by mid FY97. This objective was achieved in September 1997 with the installation of the Initial Operational Capability (IOC) version of the model. Extensive acceptance and operations testing is scheduled for early FY98.

Global Deployment Analysis System (GDAS). The U.S. Army Concepts Analysis Agency (CAA) has developed GDAS, a high resolution transportation modeling system for the comprehensive simulation of end-to-end deployment of troops, equipment and supplies from CONUS/OCONUS origins to theater tactical assembly areas (TAAs). GDAS, which combines a multi-modal entity model with a relational database system, provides seamless simulation of mobility of forces from origin to within-theater destination. GDAS is unique in its capability to distribute distinct types of cargo onto vehicles of multiple modes (e.g., road, rail, air, sea, pipeline, inland waterway) across an expandable global network with detailed facility structure. GDAS combines scheduling techniques for effective selection of mode, route, and assignment of vehicles with an objective of achieving timely deployment in combination with efficient use of resources based on user priorities. The data structure is expandable by network, vehicle type, and facility type. Tools for preventing data inconsistencies have been built into the relational database. Recent major applications include the Reception, Staging, Onward Movement, Integration plus Strategic (RSOI-S) Study, the Support Force Requirements Analysis FY 2005 (SRA-05) Study, the Decision Support Model - RSOI (DSM-RSOI) Study, the Strategic Lift Trade-off (STRATLOFF) Study, and support for other analyses, including the Quadrennial Long Range Deployment Analysis for ODCSOPS and Force XXI. Formal GDAS training has been conducted at both CAA and USTRANSCOM and installation discs and user manuals have been released to interested groups. GDAS expansion during FY98 includes conversion of the relational database to Microsoft Access 97.

Mobilization Capabilities Evaluation Model (MOBCEM). MOBCEM will simulate the mobilization process for units and individuals from Home Station to Port of Embarkation (POE). The MOBCEM prototype model completed in FY95 was successfully evaluated and is now the basis for full-scale model development which started in January 1996. The development is currently in the early stages of Phase II. While the prototype concentrated on activities at the Mobilization Station, Phase I development incorporated Home Station processing, requisitioning, transportation between stations, depots and design of the interface of MOBCEM with deployment models. Phase II will include design and implementation of Training Centers, CONUS Replacement Centers and POEs, as well as an extended GUI with additional output reports and graphics. Phases I and II of the full-scale development will constitute the Army version of MOBCEM, expected to be completed in mid 1998. The mobilization processes of the other services will be added in Phase III. MOBCEM will be the mobilization component of the Joint Warfighting System (JWARS) under development by OSD.

Methodology Improvement Efforts:

Concepts Evaluation Model (CEM). The CEM is a computer simulation model of ground and air warfare operations used by CAA to conduct analysis of the capabilities of given forces engaged in warfare at theater level or to determine the requirements for forces to meet a given conflict

situation. Previously, the CEM was modified to permit introduction of personnel casualties and equipment contamination due to chemical weapons employment and to enhance deep fire capability to more adequately reflect the commander's strategy. Following successful transport of the model to the laptop PC environment, using a Unix-like operating system, CEM was used several times during the year by a team of analysts deployed OCONUS for in-the-field campaign analysis. Other improvements in FY97 included expansion of the number of weapon systems which can be treated in the model and the development of an extensive new data post-processing capability using standard database and spreadsheet tools with a graphical user interface to provide the user with a greatly expanded and highly flexible system for the analysis and display of campaign simulation results.

Stochastic Concepts Evaluation Model (STOCEM). A stochastic version of the CEM, called STOCEM, provides users the option of treating certain CEM processes— including commanders' decisions, the assessment of combat attrition, the disposition of casualties and of combat-damaged vehicles, and the movement of engaged forces—as stochastic (based on statistical distributions) rather than deterministic (based on expected values). STOCEM research during FY97 examined the sensitivity of the most critical simulation results to the specific CEM processes which are treated stochastically, using two current scenarios, the Northeast Asia and Southwest Asia campaigns for the SRA-05 study, as the test cases. Investigation also continued on the question of alternative ways to treat stochasticity based on the recommendations of the Ardennes Campaign Study (ARCAS), which applied STOCEM to the historical 1944 Ardennes campaign, in order to improve the fidelity and robustness of the simulation. Plans for FY98 include further efforts toward STOCEM validation using historical data and simulations of the July, 1943 Battle of Kursk.

Combat Sample Generator (COSAGE). This division-level stochastic simulation model continues to be used to generate weapon system level attrition and expenditure data for use by a number of theater campaign models, including, but not limited to, CAA's CEM, FORCEM and ARES models. Little change has been made to the functionality of the model during the last year. Instead, attention has been concentrated on reducing the effort required to prepare input data, run the model and analyze the results, with the aim of improving the quality of the final product. To this end, the COSAGE Data Management System (CDMS2) project, has been organizing COSAGE input data into tables in a relational database management system, with a graphical user interface for simple and rapid data manipulation. Similar effort is being expended on the development of a whole new set of post-processor methods for analysis of model output data, using database management systems and spreadsheet applications.

Eagle Combat Model (Eagle). During FY97 the Eagle model was used in support of the Value Added Analysis V Study, the CAA contribution to the Quadrennial Defense Review and the Mini-POM exercise. Also, the model was institutionalized at CAA through training, documentation, sensitivity analysis testing and the construction of additional scenarios. Major enhancements included sensitivity analysis of the direct-fire target acquisition and attrition algorithms and modification to the pre- and post-processors. Major development work included the design and partial implementation of a new logistics module for the model and the sponsorship of an effort by the U.S. Army Waterways Experiment Station (USAWES) to develop a new terrain data pre-processor using the Terrain Evaluation Model (TEM) standard Army software.

Force Analysis Simulation of Theater Administrative and Logistics Support (FASTALS). Significant logic changes to the model continued in FY97 under a model modernization program begun in FY95. A major logic change was to increase the number of workloads representing military logistical activities, thereby raising the level of resolution in determining the type and number of units required for the support force structure. An improved POL consumption methodology was developed to better reflect the percent of time in moving and stationary states for units. New output reports and extensive revisions to existing reports were implemented and considerable effort was devoted to the verification and validation of the model. New algorithms, data requirements and reports were coordinated with other outside user agencies. All of these enhancements were applied successfully in the FASTALS support of the SRA-05 study.

Computer Assisted Match Program (CAMP). Over the past two years, a major upgrade to CAMP has been undertaken, resulting in numerous

enhancements in this process for generating Army unit and non-unit movement requirements. These have included: aggregating the JOPES cargo category codes to bring them in line with the cargo categories used in Joint Staff deployment analysis; revising edit programs for compatibility with the data that is currently available on the SAMAS force tape; automatically assigning units to pre-positioned equipment sets; virtually eliminating manual operations to subdivide division units into brigade packages; creating movement requirement records for the pre-positioned portion of unit equipment to support subsequent intra-theater deployment analysis; creating a prototype program to interface with the developing MOBCEM model; and expanding the process to deal simultaneously with up to eight theater scenarios.

INFORMATION TECHNOLOGY (IT)

The Agency strives to achieve a hardware and software environment which places at the disposal of each analyst, an automation toolset sufficient to meet that analyst's needs. This toolset is designed to be flexible so that it can be readily modified/enhanced to meet changing needs in a reasonable manner. Through networking of individual computers and cross-platform software compatibility tools this seamless analyst's environment is rapidly becoming reality. During a three-year aggressive IT Modernization effort workstations and network assets have been replaced and/or upgraded to gain this working environment. In FY97 the following significant automation items have been added:

Portable/notebook Pentium computers (26)
PowerMac 9600 (2)
Pentium-based PCs (73)
IBM RS-6000/590 Workstations (3 upgrades)
Auspex superserver increase to ~500GB storage
Sun Ultra 2200 Workstations (11)
Silicon Graphics Octane Workstations (2)
Firewall Servers & Secure Mail Server

The workstation and microcomputer enhancement are in concert with the program to replace/upgrade approximately one-third of our IT assets each year, to maintain leading-edge technology capability for analysis.

MISSION AND MANAGEMENT SUPPORT

PERSONNEL MANAGEMENT

Organization and TDA.

- **Structure.** CAA continued operating as a flat organization with thirteen division chiefs reporting to the Director (reference Chapter 1, Figure 1-2).

- **TDA.** The FY97 TDA authorized the same number of civilian and military positions as the FY96 one with the exception of the high grade cap which was reduced by two. The FY98 TDA has a net reduction of three spaces from the FY97 one and reduces the high grade cap by one. The Headquarters Redesign Initiative had the following impact on the FY98 TDA: reduced the total strength by 10% (13 civilian and 5 military spaces), added 15 civilian spaces from Logistics Integration Agency and a Logistics Analysis Mission, and renamed the Agency The Center for Army Analysis.

- **High Grade Cap.** The number of GM/GS-14s and 15s continued to be managed at the DA level.

- **Relocation.** Implementation of the 1995 Base Realignment and Closure (BRAC) recommendation to relocate this Agency to Fort Belvoir continued. The Baltimore District of the U.S. Army Corps of Engineers completed the design of a new building for 180 people to be constructed at Goethals and Franklin Roads at Fort Belvoir, Virginia. The construction contract was awarded 25 August 1997 to Sigal Construction Co., and the notice to proceed was issued 15 September 1997. The current schedule has a move-in date of 25 March 1999.

- **Personnel Strength.** FY97 personnel end strength by quarter were as follows:

CIVILIANS

Quarter	Authorized	Assigned
1	124	120
2	124	118
3	124	114
4	124	113

MILITARY

	Authorized			Assigned		
Quarter	Off	Enl	Tot	Off	Enl	Tot
1	53	1	54	49	1	50
2	53	1	54	51	1	52
3	53	1	54	49	1	50
4	53	1	54	47	1	48

OPERATING BUDGET RECAP

A summary of the Agency's FY97 budget execution, by major expense category is provided below. The Agency's direct funding obligation rate was 99.9%. External funding obligation rate was 100%.

Budget Category	Direct Funding (OA 22 Provided) ($000)	External (Outside Agencies) ($000)	Total (OA22+Outside) ($000)
Payroll & Benefits	$9,133.1		$9,133.1
ORSA CELL/ISC	$161.3		$161.3
Maintenance	$174.3		$174.3
Security	$272.8		$272.8
Communications	$150.7		$150.7
Licenses & Leases	$86.9		$86.9
Supplies & Equipment	$390.8	1,286.3	$1677.1
Reproduction	$23.0		$23.0
Travel	$234.1	$164.5	$398.6
Training	$260.7	$34.0	$294.7
Facilities	$0		$0
Study Support	$455.2	$96.2	$551.4
Total Direct Funding	$11,342.9	$1581.0	$12,923.9

The agency was able to fund essential programs from direct funding authority, as well as make significant upgrades of computer hardware. Considerable funds were allocated by the agency, as well as outside activities, to provide analysts the hardware and software tools necessary to conduct their day-to-day study and modeling activities.

As in previous years, a significant level of funding was received from activities outside of CAA. These funds provide an extra measure of flexibility to our program, and continue to provide a great benefit to the agency. The following is a list of

major funding provided directly to CAA from outside activities:

- $732K - From the Information Systems Command for ADP productivity improvements.
- $470K - From Model Improvement Study Management Agency (MISMA) (AMIP/SIMTECH) for hardware and software in support of CAA studies and modeling activities.
- $132K - From OSD to support DAWMS.
- $90K - From EUSA/USFK for travel to Korea in support of studies for the command.
- $70K - From DOD to support the Anti-personnel Mines Study.
- $40K - From USAADA Center to support MOBCEM.
- $34K - From Information Management Support Center for AI Course.
- $13K - From USAMMA to support study-related travel.

SECURITY

Orientation and Training. The CAA Security Office conducted the following activities: Agency security procedures presentations to CAA Newcomers' Orientation class and the annual NATO security access briefing. SAEDA briefing given to all CAA employees in October 1996.

Inspections.

- The annual NATO security inspection was conducted by the Office of the Central US Registry, NATO, during November 1996, and no major discrepancies were noted.
- The Physical Security Survey inspection was completed by Mr. Dennis G. Thomidis, Chief, Force Protection Branch, HQDA Security Services Division, Washington, DC. No major discrepancies were noted.
- The annual TOP SECRET inventory was conducted during May 1997, by the Top Secret Control Officer and an individual from the EAD/NBC Division. A complete accounting was made of all TOP SECRET documents held by the Agency.

Other.

- Submitted plans to the Chief of Engineers for installation of access control system for new building.
- Updated all SCI billets, submitting changes to DA/SSO.
- Updated the Occupant Emergency Plan and distributed changes to effected personnel.
- Installation of 90 (X07) locks was completed on security containers to be taken to new CAA building at Ft. Belvoir.

LOGISTICS

Procurement Actions: The agency Information Technology modernization effort that has been described on page 4-5, consisted of many acquisition actions and several contracting procedures such as the IMPAC credit card, government-wide acquisition contracts (GWAC), task orders, and indefinite delivery/indefinite quantity (IDIQ) contracts. Several large-item purchases were completed with considerable savings on these investments and with less processing time.

Utilizing the small business (8a) task order contract with GMSI, a non-government systems analyst was dedicated to this agency, the network system was upgraded, and a firewall server was purchased and installed.

The GDAS programming service multi-year contract was awarded to Noetics. Each task order will provide detailed program updates and documentation.

With the increased use of the agency credit card, the procurement lead time was greatly reduced in obtaining computer supplies, services, and equipment from several months to a few days.

PUBLICATIONS, GRAPHICS, AND REPRODUCTION

Equipment and Services. Publications continued to provide editorial, keyboarding, data conversion, data archive and restoration, graphic arts, audio-visual, and photographic support to the Agency. Branch personnel have been provided with enhanced hardware and software commensurate to the jobs at hand.

Publications. This year the Branch assisted in the preparation, publication, and dissemination of approximately 61 documents including study reports, technical papers, research papers, and memorandum reports. Other Branch projects included preparation of special displays for the MORS Symposium, AORS Symposium, Human Dignity Council, Federal Women's Program, Association of the US Army (AUSA), Black History Month, Hispanic and Asian-American Heritage, and other CAA functions. Special displays and video support were provided for numerous political-military games as well as for other functions.

Reproduction. Coordinated by the Printing Control Officer, the Agency's reproduction workload continues to be accomplished by Defense Automated Printing (DAP) at two locations: unclassified work at Bethesda Navy Medical Center and classified and special format documents at Navy's Carderock facility. Turnaround time and quality of support continue to be more than acceptable. Approximately 170,584 unclassified impressions and 44,626 classified impressions were reproduced by DAP this year. Two walkup copiers leased through DAP were upgraded to provide more efficient support; in excess of 137,761 impressions were logged on these two copiers.

ANALYTICAL EFFORTS COMPLETED BETWEEN FY90 AND FY97

This chapter contains a title listing of all analytical efforts completed by CAA during the period FY91 through FY97. Contact CAA (ATTN: CSCA-MS) if information is needed for CAA analytical efforts completed prior to FY90.

FY97 STUDIES

ACRONYM	TITLE	SPONSOR
AFPDA-03	Army Force Planning Data and Assumptions - 2003	DCSOPS
PAR-P4	Personnel Attrition Rates in Land Combat Operations, Phase 4	CAA
SRA-05	Support Force Requirements Analysis 2005	DCSOPS
STALDRUG	Statistical Analysis for the Land Disposal Restriction- Utah Group	USA MEDCOM
STRATLOFF	Strategic Lift Tradeoff	DCSOPS
YATIRP	Yearly Analysis of Techniques for Installation Readiness Prioritization	ACSIM

FY97 QUICK REACTION ANALYSES & OTHER PROJECTS

05CAN	SRA-05 Campaign Analysis	DCSOPS
ACAR	Authorization of CINC Assets to Requirements	DCSOPS
ADAFSA05	Air Defense Artillery Force Structure Analysis-2005	DCSOPS
ADVReport	Prepare Memorandum Report documenting PHALANX articles	CAA
AF-JCHEM3-UP	Air Force JCHEMRATES III Update	DCSLOG
AFS	Alternative Force Structure	VCSA
AMUCK	Army Modernization Update- a Time-Constraint Problem - 1	DCSOPS
AMUCK2	Army Modernization Update- a Time-Constraint Problem - 2	DCSOPS
AMUCK3	Army Modernization Update- a Time-Constrained Problem - 3	DCSOPS
AMUCK4	Army Modernization Update- a Time-Constrained Problem - 4	DCSOPS
AMUCK5	Army Modernization Update- a Time-Constrained Problem - 5	DCSOPS
AMUCK6	Army Modernization Update- a Time-Constraint Problem - 6	DCSOPS
APLM	Anti-Personnel Land Mine Study	SARD
APLM-NE	Anti-Personnel Landmine Study/NEA	SARD
APLM2	Anti-Personnel Landmine Study #2	SARD
ARCOPLAN	ARCENT OPLAN	ARCENT
ARES	Advance Regional Exploratory System	DUSA-OR
ARFERR-1	Ardennes Fractional Exchange Ratio Research - Phase 1	CAA
ATOMIUM 97	ATOMIUM 97	DCSOPS
BIOCAS	Biological Casualty Assessment Study	PERSCOM
BRACKEN	Theater Model Comparison	DCSOPS
BTP-EXP	Breaking the Phalanx Exploration	DCSOPS
C4ISRID	C4ISRID Influence Diagram Model Construction	DCSOPS
CAC-05	Campaign Analysis - Chemical 2005	DCSOPS
CAF21	Campaign Analysis for Force XXI	CAA
CARDEALR	Calculating Requirements for Deployment/Logistical Resources	USAREUR
CASCOM LPF	Review of CASCOM Logistic Planning Factors - Class V & VII	CAA
CASRA-05	Campaign Analysis for Support Requirements Analys is 2005	DCSOPS
CBMR-WARREQ03	Capabilities Based Munitions Requirements using WARREQ-03	DCSOPS
COAFIB	Costs of Alternative Forces in Bosnia	DCSOPS
COF-OF	CENTCOM Operational Fires	USCENTCOM
COMP-D2X	Comparison of DAWMS and 2 Other Analyses	DCSOPS
COP98	Combined Forces Command Operations Plan 1998	EUSA
COP98-HI	CFC Operations Plan 98 - High Chem	EUSA
COP98-LOW	CFC Operations Plan 98 - Low	EUSA
COP98-VAR	CFC Operations Plan 98 - High Chem	EUSA
COS-J8	J8 Request for COSAGE Combat Samples	JCS
COS-SLOC	TAA05 COSAGE Data for OSD-SLOC	DCSOPS
COS-USAF	USAF Request for TAA 2005 COSAGE Data	AFSAA

CRD-SSI	Casulty Rates Data for Soldier Support Institute	DASG
CRD-TAPC	Casualty Rates Data for Total Army Personnel Command	TAPC
D-WORRM	Deep Attack Weapons Mix Study Support - WORRM Model	DCSOPS
DAMSA	Decision Analysis for MTMC Site Alternatives	ACSIM
DAWMS (SF)	DAWMS Scaling Factors	DCSOPS
DAWMS-HS	DAWMS Helicopter Sortie Excursion	DCSOPS
DAWMS-LOG	DAWMS Logistics Excursion	DCSOPS
DRM-I	Degrade Risk Matrix	EUSA
DSM-RC	Decision Support Modeling (Resource Constrained)	EUSA
DSM-RSOI	DSM IV - Reception, Staging, Onward Movement & Integration	EUSA
ECI-SWA-97	Expediting the SWA Counter-offensive	VCSA
EFBALL	Economic Failure Based Upon Albania Lessons Learned	USEUCOM
EN-DSM IV	EN Support to Decision Support Modeling IV Follow up	EUSA
EXERS97	Exercise Roving Sands 1997	ARCENT
FAO	Force Augmentation Options 98	EUSA
FAR SIDE	Fleet Age Recapitalization - System Input Data Excursions	DCSOPS
FEDEX	Force XXI Echelon Above Division Design Evaluation Excursion	TRADOC
GDAS-MCOM	GDAS Model Comparison	CAA
HARPI	Health Assessment Risk - PERICLES Improvement	DASG
HEADI	Heavy Division Impact	DCSOPS
IAMSEP	Imbedded vs. Applique Mix of SEP	PAE
IWSIM	Information Warfare Simulation	DISA
JPACS-IW	JPACS Phase I KIDA Chem-Bio Issues Workshop	EUSA
LSC	Logistical Support to Counteroffensive	EUSA
MARTYRDOM	MARTYR Doing Other Matches	CAA
MERCS-SSA	Measuring Ethnic Religious Communal Stress, Sub-Sahara	USEUCOM
MRED II	Managing Research in Environmental Decision Making II	ACSIM
NEWMEC	New Methodology for Combat Support Companies	DCSOPS
NMC-JCR3	New Mask Concept for JCHEMRATES III	AMC
OFP-I	Objective Force Planning - Workshop #1	DCSOPS
OFP-II	Objective Force Planning - II	DCSOPS
P2POM	P2 Investment Strategies in Support of 98-03 POM	ACSIM
PFMF	Planning Future Military Forces	DCSOPS
POLA	Phased Offline Attrition	CAA
PREMOB-SA	Premobilization Sensitivity Analysis	EUSA
PRISM-97	Partnership for Peace & NATO/MED Working Party Pol-Mil Game	DASG
PTOF	Planning Tool for Operational Fires	ARCENT
QDR I-DC	QDR I - Dynamic Commitment	DCSOPS
QDR I - DCR	QDR I - Dynamic Commitment Revisited	DCSOPS
QDR-FA	QDR Force Assessment	VCSA
QDR-II CA	Quadrennial Defense Review - II Cluster Analysis	DCSOPS
QDRF-RA	QDR Force - Risk Analysis	VCSA
QDRLR-DA	Quadrennial Defense Review Long Range - Deployment Analysis	DCSOPS
RS97	Roving Sands 97	ARCENT
SAAALAAA	Support to the Army Audit Agency's Land Acquisition Analysis	ACSIM
SAMSONITE	Survey of Army Mobility: Strategic Operations, Nat'l Infras, Tech & Equip	DCSLOG
SEACA	Simulation Enhancements from Ardennes Campaign Analysis	CAA
SICS	STOCEM Investigation of COSAGE Sampling	CAA
SMOR	Saudi Military OR Training	DUSA-OR
SOKCOM	SRA-05 Share of Kill Comparison: CAA & CENTCOM	DCSOPS
SRA-05 DA	SRA-05 Deployment Analysis	DCSOPS
SRA-05 DA/BC	SRA-05 Deployment Analysis/ Base Case	DCSOPS
SRA-05 DA/LM	SRA 2005 - Deployment Analysis - LRC/MRC	DCSOPS
SRA05 EC	SRA 05 Early Counter Offensive Excursion	DCSOPS
TA	Transportation Analysis	DCSOPS
TAA CHEM E	Total Army Analysis Chemical Excursion, East MRC	DCSOPS
TAA CHEM W	Total Army Analysis Chemical Excursion, West MRC	DCSOPS
TAA05 WEAR	TAA05 Wartime Executive Agent Responsibility	DCSLOG
TACWAR-NEA	TACWAR Support to DAWMS Effort in NE	DCSOPS
TAEBAEK 97	TAEBAEK 97 Political/ Military Game	EUSA
TAF21	Theater Analysis for FXXI	TRADOC
TF97	TALKING FISH 97 Political/ Military Game	DCSOPS
TIM	TACWAR Installation and Modification	CAA
TNP	The "New Paradigm"	DACS

TS2TS	Transportation Structure Sensitivity to TAA03 Stockage	DCSOPS
WARREQ-03C	Wartime Requirements - FY03 Chemical	DCSOPS
WSR-APC	Warfight Sustainability Report (APCs)	EUSA
WSR-M	Warfight Sustainability Report (Mortar)	EUSA

FY96 STUDIES

ALCHMMI	Assessment of Log & Costs for Haz Mats Mgmt Implementation	ACSIM
APAB-PI	Active, Passive, Attack, BMC41 - Pillar Integration	USA SSDC
ARCAS-FO	Ardennes Campaign Simulation - Follow on	CAA
DSM IV	Decision Support Modeling IV - Support for CFC/USFK J-5	USFK
ELVS	Evaluating Land Value Study	DCSOPS
ITMD-CAP	Integrated Theater Missile Defense - Capability Assessment	DCSOPS
JCHEMRATES III	Joint Svc Chemical Defense Equipment Consumption Rates III	DCSLOG
KURSK III	The Battle of Kursk, Southern Front - Phase III	CAA
LOGWAR	Impact of Army CSS on Warfighting Capability	DCSOPS
NBCCAS	NBC Casualty Assessment Study	DCSPER
NIA-2	Nuclear Impact Assessment - 2	DCSOPS
PAR-P3	Personnel Attrition Rates in Land Combat Operations, Phase 3	CAA
PASMPR	Prioritization of Army Strategic Mobility Project Resources	DCSLOG
PERICLES	Political/Economic Risk in Countries & Lands Evaluation	DCSINT
PERSEUS	Plng Environmental Resource Strategy Evolution & Util Sty	ACSIM
SRA-03	Support Force Requirements Analysis-2003	DCSOPS
SRA-05C	SRA-05 COSAGE	DCSOPS
SRA05-BC(NS)	SRA-05 MRC(NS) Base Case Campaign Development	DCSOPS
VAA 98-03	Army Program Value Added Analysis 98-03	DCSOPS
WARREQ-03	Wartime Requirements Near Term Simultaneous Dual MRC, FY2003	DCSOPS

FY96 QUICK REACTION ANALYSES & OTHER PROJECTS

A2MR	Anti-Armor Munitions Requirements	DCSOPS
A2R2	Anti-Armor Requirements & Resource Analysis Study	DCSOPS
AATOP-02	Army Attack Operations-North East Asia 2002	USA SSDC
ABAPM-SWA	Assessment of Banning Anti-Personnel Mines - SWA	DCSOPS
AEA-MDSQ	An Examination of Alternative MDSQ Factors	DCSOPS
AMUSE	Assessment of Military Units with Spreadsheet Effort	DCSOPS
APC1-4	Alternate Procurement Campaigns	PAE
ARBATTS	Army Battalions	DCSOPS
ASP 96	Army Strategic Planning Workshop - 1996	DCSOPS
BOSS	Bosnia, SWA Scenario	DCSOPS
BRSA	Brown and Root Substitution Analysis	DCSOPS
CANTELOUPES	Cost Analysis Tool-Estimate Lt Opns Peacekeeping Scenarios	DCSOPS
CAS-TO-SPT	Casualty Estimation w/in CS & CSS Functional Areas	DASG
CATMID I	Campaign Analysis, Integrated Theater Missile Defense Ph I	USA SSDC
CD-SUSA	Contingency Deployment - CAA Support to 3rd US Army	ARCENT
CONPLAN 1015RA	Contingency Plan 1015 Requirements Analysis	ARCENT
DAD	Data Analysis of Demography	DCSOPS
DAWMS	Deep Attack/Weapons Mix Study Support	PAE
DAWMS (AD)	DAWMS (Air Defense)	DCSOPS
DAWMS SPT	DAWMS Support	DCSOPS
DFP-K	Dual Force Packages for Korea	FORSCOM
DNBI-EFFECTS	Impact of DNBI Casualty Rates on Theater Force Structure	DCSOPS
DSMIV-WARN	DSM IV - Korea as a Second MRC - Warning Excursions	EUSA
EIC-SWA	Early Counteroffensive Investigations - SWA	DACS
ELVS II	Evaluation of Land Value Study II	DCSOPS
EUCOM-LA	EUCOM Landmine Analysis	USEUCOM
FAD	Forecasting Available Dollars	DCSOPS
FAR ARMS	Fleet Age Recapitalization - Armored Systems	DCSOPS
FAR COMMS	Fleet Age Recapitalization - Communications System	DCSOPS
FAR FIRES	Fleet Age Recapitalization - Fire Support	DCSOPS
FAR HELOS	Fleet Age Recapitalization - Helicopters	DCSOPS
FAR WHEELS	Fleet Age Recapitalization - Tactical Wheeled Vehicles	DCSOPS
FOCAA	Four Country Analysis of Africa	USEUCOM
FUN-CATS	Functional Category Battle Casualty Rates	USAFISA
GF95	Groundfire 95 Low Level Radiation Issues Workshop	DCSOPS

GHQ-95 PPRDE	Non-divisional Combat Forces Casualty Rates	DASG
GMAS-DA	Ground Maneuver Analysis Support - Data Analysis	DCSOPS
GOU	GCC OPLAN Update	EUSA
GS96	Groundshine 96	DCSOPS
GT96	GDAS-TPFDD 96	EUSA
HEDRISM	Heavy Division Reduction Impact on Strategic Mobility	DCSOPS
HELIARC	Helicopter, Attack/ Reconnaisance - Campaign Modeling	DAIG
ILIB	Impact of Light Brigades on Division Design	TRADOC
ILOOK	Internal Look	ARCENT
ILS2	Internal Look-1015	ARCENT
IPS	DPG IPS Review	DCSOPS
JCBD PRI	Joint Chemical & Biological Defense Program Prioritization	DCSOPS
JTAD BMC4I	Joint Theater Air Defense BMC4I Analysis Working Group	AFSAA
KILBASA	Korea Intermediate Logistics Base Support Assessment	USARPAC
KOBOSH III	Korea, Bosnia, Haiti Analysis, Third Version	DCSOPS
KUTRACE	Kuwait Training Cost Estimate	DCSOPS
LEGAL MIX	LEGAL MIX Support	TRADOC
LOTSA-MSLS	Lower Tier Stockage Alternatives-Missile Inventory Solutions	USA SSDC
MDSQ-EVALU	Minimum Distribution System Quantity Evaluation Update	DCSOPS
MODERN ROK	Modernization of Network in ROK	DUSA-OR
MRED	Managing Research in Environmental Decision Making	ACSIM
OFP	Objective Force Planning	CAA
OP1002-CL	OPLAN 1002 Consumption and Losses	ARCENT
PAM	Prioritization of Antitank Munitions	DCSOPS
PC-96	Pacific Challenge 96 Political-Military Game	DCSOPS
PE-FP	Peace Enforcement - Force Protection	DCSOPS
PHANTOM WARRIOR	Phantom Warrior	ARCENT
PMS	Partial Modernization Strategy	PAE
PMS-EAGLE	Partial Modernization Strategy (EAGLE)	PAE
PV-95	Pacific Vision 95 Issues Workshop	DCSOPS
QUAILMAN	Quality of Life Measurement and Analysis	ACSIM
RDA3	Research, Development & Acquisition Alternative Analyzer	DCSOPS
SCAT	Support for CSA Testimony	DCSOPS
SNCO	Sourcing NATO Contingency Operations	DCSOPS
SOAP-D	Southwest Asia OPLAN Analysis of Patriot - Deployment	ARCENT
SORREQ	Sortie Requirements	DCSOPS
STAAF	Stability Analysis of Africa	USAREUR
STRAT-3X	Strategic Deployment to Korea and Two Other Pacific Regions	DCSOPS
SW-PREPO	Southwest Asia Preposition Strategy	ARCENT
SWAPP	SWA Additional Patriot Preposition Analysis	ARCENT
TLC-EVAL	Theater Logistics Concept Evaluation	DCSOPS
TLS-ADS	Theater Level Simulation of Ammunition Distribution System	DCSOPS
TMD COEA	Theater Missile Defense COEA	USA SSDC
TMD COEA-2	Theater Missile Defense COEA - Phase II	USA SSDC
TOPR	TAA-03 OSD PA&E Review	DCSOPS
VAA-COMSUP	VAA 98-03 Corps Operations Modeling Support	DCSOPS
VAA-UC	VAA Unit Cost	AMC
WARBLORR	Wartime Based Lieutenant Officer Replacement Requirements	DCSPER
WSR-ARTY	Warfight Sustainability Rpt - Artillery	EUSA
WSR-HELO	Warfight Sustainability Rpt - Helicopters	EUSA
WSR-TANK	Warfight Sustainability Report (Tank)	EUSA
X-MLRS-2	Follow-on Analysis for JPSD	SARD

FY95 STUDIES

AFPDA 97-03	Army Force Planning Data and Assumptions FY 1997-2003	DCSOPS
EAD-CAS-MET	Echelon Above Division Casualty Estimation Methodology	DCSPER
KAMMO	Korean Ammunition Distribution System Analysis	EUSA
MOBCEM-PD	Mobilization Capabilities Eval Model - Prototype Devlopment	DCSOPS
PAR-P2	Personnel Attrition Rates in Land Cbt Opns, Phase 2	CAA
ROLES/MISSIONS	Analysis Support for Army Roles and Missions	DCSOPS
RSOI-S	Reception, Staging, Onward Mvmt, & Integration - Strategic	EUSA
SEW	Synthesizing Energy Worth	ACSIM
WARPATH	War Reserve Positioned Across Theater(s)	DCSLOG

FY95 QUICK REACTION ANALYSES & OTHER PROJECTS

95KOR-SEN	Korean Combat Samples with Modified Sensors - 1995	EUSA
AAMAA II	Anti-Armor Mission Area Analysis Phase II	DCSOPS
ABC	Artillery Brigade CS/CSS Analysis	ARMY SCI BD

ABC-APR	Analysis of BCTP vs. CAA - Ammo Process & Results	DCSOPS
AFPDA-DA	Army Force Planning Data & Assumptions - Document Automation	DCSOPS
ARF	Army Required Forces	DCSOPS
ARSTRAP	Army Strategic Planning Workshops	DCSOPS
BF-95	Blue Flag 95	ARCENT
BF-II	Blue Flag II	ARCENT
BF3	BLUE FLAG 3	ARCENT
BFIII-S	BLUE FLAG III Support	ARCENT
BLACKJACK 95	Assumptions Working Group for Campaign XXI	DCSOPS
BOST95	BOLD STROKES 95 Pol-Mil Game	EUSA
BRAIN	Bayesian Representation & Analysis in International Negotia	DUSA-OR
CAMPAIGN XXI	Campaign XXI	DCSOPS
CAMRULE	Cost Analysis for Munitions Rule	ASA
CANIA-2	Campaign Analysis Nuclear Impact Assessment - 2	DCSOPS
CARSTAR-94	Campaign Analysis for Army Strategic Force Architecture-94	DCSOPS
CATMID	Campaign Analysis for Integrated Theater Missile Defense	CAA
CORAL REEF	Correlate Funding to Readiness for Reserve Forces	OCAR
CURAM	Chemical Unit Requirements Analysis Methodology	DCSOPS
DFP	Dual Force Packages	FORSCOM
DSM I	Decision Support Modeling - Single MRC	EUSA
DSM II	Decision Support Modeling II- Dual MRC	EUSA
DSM III	Decision Support Modeling III- Support for CFC USFK J-5	EUSA
EBSFI	Enhanced Brigade Support Force Impact	DCSOP S
EUCOM-FRE	HQ EUCOM Force Requirement Exercise	DCSOPS
FACEI	Feasibility Analysis of CTLS-Eagle Interoperability	DUSA-OR
FAST-OR	Force Analysis Spreadsheet Tool - OOTW Requirements	DCSOPS
FOPROA II	Force Projection II	CENTCOM
FREEFALL 95	FREEFALL 95 Political-Military Game	DASG
GHQ-95 P2	General Headquarters Exercise Part 2	DCSOPS
GHQ-95 P3	General Headquarters Exercise Part 3	DCSOPS
GHQ-95 P4	General Headquarters Exercise Part 4	DCSOPS
GHQ-95 P5	General Headquarters Exercise Part 5	DCSOPS
GHQ-PD	GHQ 95 Personnel Data	TAPC
GHQ-PPD	GHQ-95 Peacekeeping Personnel Replacement Data	DCSOPS
GHQ-X95 P-1	General Headquarters Exercise X95 Phase I	DCSOPS
GMAS	Ground Maneuver Army Support	DCSOPS
GMAS-IA	Ground Maneuver Analysis Support - Issue Assessment	DCSOPS
GMAS-II	Gound Maneuver Assessment Methodology - II	DCSOPS
GMAS-NI	Ground Maneuver Analysis Support-Needs Identification	DCSOPS
HL-95	HAMMERLOCK 95 Pol-Mil Game	DASG
JAMIP/JWAR	Joint Analytic Model Improvement Program, Joint Warfare System	DCSOPS
JCBD(NT)	Chemical Joint ServiceInte-gration Group Analysis Support	DCSOPS
JROC-TRACK	Tracking JROC through the ARSTAF Lead Agents Working Group	DCSOPS
KAMMO-SLAM	Korean Ammo Distribution System Analysis using SLAM	EUSA
KOBOSH II	Korea, Bosnia, Haiti Analysis, 2nd Version	DCSOPS
KURSK II	The Battle of Kursk, Southern Front, a Validation Database	DUSA-OR
LIBAITAN	Linking BASOPS Investments to Training & Readiness Analysis	ACSIM
LINGLANG-II	Linguist and Language Analysis II	DCSINT
MINIPOM-95	Value Added Analysis Support to Mini POM 97-02	DCSOPS
NEARFIA	Northeast Asia Regional Forces Intelligence Assessment	CAA
NEDS	A Nexus of Environmental Decisionmaking in the Services	ACSIM
NIGERIA-95	NIGERIA-95 Issues Workshop	DCSOPS
NIMBLE DANCER	Nimble Dancer Joint Staff Support	DCSOPS
NKAE	North Korean Artillery Effects	EUSA
OLYMPUS-94	OLYMPUS-94 Pol-Mil Game	USAREUR
PERSREP-GHQX95	Personnel Replacement Requirements Analysis GHQX95 Scenario	PERSCOM
PPROFOR	Power Projection Forces	DCSOPS
PROSPPECT	Plan Research Operations Strategy for P2 Efforts	ACSIM
PSS-VULFACS	Vulnerability Rates for Personnel Service Support Branch	CASCOM
REIN DEER	Researching Environmental Initiatives & Decision Evaluation Rules	ACSIM
REPREPO	Reconstitution of the Prepo-Afloat Package	DCSOPS
RSOI-GDAS	Reception, Staging, Onward Movement and Integration - GDAS	EUSA
SAIM-11/94	SAMAS November-94 Update of Reserve Component Data	ACSIM

SOA	Stockage Objective Analysis	DCSOPS
SOMR-HA	SRA-03 OOTW Movement Requirements - Humanitarian Assistance	DCSOPS
SOMR-LRC	SRA-03 OOTW Movement Rqmts Lesser Regional Contingency	DCSOPS
SOMR-PE	SRA-03 OOTW Movement Requirements - Peace Enforcement	DCSOPS
SOMR-PK	SRA-03 OOTW Movement Rqmts-Peace Keeping	DCSOPS
SPT2XXI	Analytical Support to Force XXI	DCSOPS
SRA-03 DA	SRA-03 Deployment Analysis	HQDA
SRA-AC(OWIT)	SRA - Adverse Case (Only War in Town)	DCSOPS
SRA03-MED-FACT	SRA-03 Medical Planning Factors Alternatives Analysis	DCSOPS
SUSCM	Support Slice for C-17 Movement	DCSOPS
SWA-FOPROA	Southwest Asia Force Projection Assessment	ARCENT
SWAAGS	South West Asia Armored Gun System Effectiveness Analysis	DCSOPS
SWAHAKO	SWA and Haiti's impact on Korea	DCSOPS
T-CAN 02	Tactical Missile Defense COEA Analysis NEA 2002	USA SSDC
TARA	TAA Ammunition Requirements Analysis	DCSOPS
TAURUS-94	TAURUS-94 Pol-Mil Game	USAREUR
TERCDA	TAA03 Engineer Regional Construction Data and Analysis	DAEN
TOSCA	Tactical Engineering Mobility System O&S Cost Analysis	DCSOPS
TOSFRAM	TAA03 OOTW Support Force Requirements/Analysis Methodology	DCSOPS
TRAP	Transportation Rail and Pipeline Denial Analysis	DCSOPS
TRSDOC03	Theater Resolution Scenario Documentation for TAA03	DCSOPS
TU-95	Tactical Wheeled Vehicle Modernization Update - 95	DCSOPS
VW	Vigilant Warrior	CAA
WARRU-NEA	WARREQ 01 - Army Reserve Requirements Update - NEA	DCSOPS
WARRU-SWA	WARREQ 01 - Army Reserve Requirements Update - SWA	DCSOPS
WIDCOMP	War Fighting Impact of Delaying the Comanche Program	DCSOPS
WRAC-NEA	Wartime Requirements Adverse Case - Northeast Asia	DCSOPS
WRAC-SWA	Wartime Requirements Adverse Case - Southwest Asia	DCSOPS
XMLRS	Counter MLRS	SARD

FY94 STUDIES & CONTRACTS

ABC-SWA	ARSTAR-94 Base Case - Southwest Asia	DCSOPS
ACAP 94	Army Support of Cooperation & Peacekeeping 94	DCSOPS
ARSTAR-94	Army Strategic Force Architecture Study - 94	DCSOPS
ARSTAR-94 DA	ARSTAR-94 Deployment Analysis	HQDA
CASRA-03	Campaign Analysis for Support Requirements Analysis 2003	DCSOPS
COSAGE-03	Combat Samples - 2003	HQDA
COSAR	Joint Combat Sample Request	DUSA-OR
CTLS-93	Concurrent Theater Level Simulation - FY93	DUSA-OR
CVAS	Corps-level Analysis Team, VAA III Support	DCSOPS
E-MAR	EUSA OPLAN - Major Ammunition Requirements	EUSA
ETAJUP	Equitableness of Treatment in Army Judicial Procedings	DCSPER
FOUNDATION 93	Strategies for the Information War	DCSOPS
FRPPO	Force Requirements Planner for Peace Operations	DCSOPS
FUSSPRINT	Future USAREUR Site Selection Prog for Reduction in Troops	USAREUR
GAS	GHQ-94 Analytical Support	DCSOPS
GDAS-ADD	GDAS Advanced Development	CAA
GDAS-TEST	Global Deployment Analysis System - TEST	CAA
JCHEMRATES II	Joint Service Chem Defense Equipment Consumption Rates II	DCSLOG
KURSK I	The Battle of Kursk, Southern Front, Validation Database	CAA
MDSQ-EVAL	Ammunition Minimum Distribution System Quantity Planning Factors Evaluation	DCSOPS
MIKIMAC-94	Mission Kill Metric as Applied to Combat Models	DUSA-OR
MOBCEM-RD	Mobilization Capabilities Evaluation Model - Redesign	DCSOPS
MRS BURU	Mobility Requirements Study Bottom Up Review Update	DCSLOG
PAPA	Pollution Abatement and Prevention Analysis	ASAILE
PYONG-WHA 93	Pol-Mil Issues Analysis for Exercise ULCHI FOCUS LENS 93	EUSA
READMISSIONS	Personnel Attrition Rates Historic Land Combat Operations: A Note on Probability of Readmissions & Multiple Wounds	DUSA-OR
TCAS	Theater Capibilities Assessment Study, Phase I	DCSLOG
VAA 96-01	Army Program Value Added Analysis 96-01	DCSOPS
WARREQ MRC-E	Wartime Requirements MRC-East, FY 2001	DCSOPS
WARREQ MRC-W	Wartime Requirements MRC-West, FY 2001	DCSOPS

FY94 QUICK REACTION ANALYSES

3DCAN	Three Divisions Corps Analysis	TRADOC
555 CA	555K Endstrength Capabilities Assessment	DCSOPS
AAMAA	Anti-Armor Mission Area Analysis	DCSOPS
AAMAA-C	Anti-Armor Mission Area Analysis - COSAGE	OSD
ACAP II 94	Army Support of Cooperation and Peacekeeping II 94	DCSOPS
ALP-ES	Assessment of Long-Term Peacekeeping - Endstrength	DCSOPS
ALP-PT	Assessment of Long-Term Peacekeeping - Personnel Turbulence	DCSOPS
APOF	Analysis of Peace Operations Functions	DCSOPS
ARRCS-SUFA	Allied Rapid Reaction Corps (South) Support Force Analysis	USAREUR
ASUPOW	Analysis of Support Units in Peace Operations and War	DCSOPS
CL-94	CALYPSO 94 Pol-Mil Game	DCSOPS
CLIKAMMO	Campaign Logistics in Korea: Ammunition Availability Impact	EUSA
COMA	Support to Technical Advisor for Calibration of MACRO	DCSOPS
COSSEUC	Combat Samples in Support of USEUCOM OPLAN	USEUCOM
CT94	CERTAIN TRUMPET 94 Political-Military Game	EUSA
DEEP FIRES I	ATACMS Missile Requirements	DCSOPS
DEEP FIRES II	ATACMS Block II Missile Requirements	DCSOPS
DEMOB	Demobilization Issues Workshop (GHQ95)	DCSOPS
DIVRATES	Divisional Rates-Killed/ Captured/MIA & WIA	DCSPER
EAD-CASRATES	Non-Divisional Wounded in Action Rates for the Army	PERSCOM
EAFA	Early Arriving Forces Analysis	DCSOPS
EARR	Engineer Allocation Rule Revision	DCSOPS
EU-94	EUROPA 94 Pol-Mil Game	USAREUR
GF-94	GREEN FLASH Pol-Mil Game	USARPAC
GHQ PLAYER	General Headquarters Exercise-94 Player	DCSPER
GHQ-NEA I	GHQ-94 MRC-W Campaign Simulation (Part I)	DCSOPS
GHQ-NEA II	GHQ-94 MRC-W Campaign Simulation (Part II)	DCSOPS
GHQ-S	GHQ-X94 Exercise Control Group Support	DCSOPS
GHQ-S II	GHQ-X94 SWA & NEA Campaign Analysis w/Logistics Assessment	DCSOPS
GHQ-S III	GHQ-X94 Exercise Group Support III	DCSOPS
GHQ-S IV	GHQ-X94 SWA Campaign Analysis Wrap-up	DCSOPS
GIRM	Gelling Installation Resource Management	ACSIM
HDSS	Heavy Division Support Slice	DCSOPS
HILICSS	Haiti's Impact on Light Infantry and Combat Service Support	DCSOPS
IBUR-OT	Intelligence Bottom-Up Review - Operational Tasks	DCSOPS
JTAGS-EA	Joint Tactical Ground Station-Effectiveness Assessment	ASARDA
KC95	Korean Conflict '95: A Force Ratio Analysis	EUSA
KOBOSH	Korea, Bosnia, Haiti Analysis	DCSOPS
LINGLANG	Linguist and Language Analysis	DCSINT
LMS-RTW	Louisiana Maneuvers Support Road to War	TRADOC
MP01-EPW	Military Police 2001 - Enemy Prisoner of War	DCSOPS
NEAPEREQ	Personnel Replacement Requirements Analysis, GHQ NEA	DCSPER
NLWE	Non-Lethal Weapon Employment	DUSA-OR
OLMA-I	Operational Level Military	ARCENT
OLMA-I94	Operational Level Military Assessment - Iraq 1994	ARCENT
OOTW-SRA(HA)	Operations Other Than War - SRA (Humanitarian Assistance)	DCSOPS
OOTW-SRA(LRC)	OOTW - SRA (Lesser Regional Contingency - Light)	DCSOPS
OOTW-SRA(PE)	Operations Other Than War - SRA (Peace Enforcement)	DCSOPS
OOTW-SRA(PK)	Operations Other Than War - SRA (Peace Keeping)	DCSOPS
PECAN	Peacekeeping Cost Analysis	DCSOPS
PERS-MOB-SPT1	Personnel Mobilization Planning Support to TAPC-1	PERSCOM
REACH	Re-Evaluation of the Analysis on Ft. Chaffee	DCSOPS
REPWREP	Review EPW Report	DCSOPS
ROKOB	Republic of Korea Ground Forces Order of Battle Update	EUSA
RSOI-O	Reception, Staging, Onward Movement & Integration Operations	EUSA
SADEX	SADARM Examination	DCSOPS
SH-93	SHALIMAR 93 Pol-Mil Game	USARPAC
SH-94	SHALIMAR 94 Pol-Mil Game	USARPAC
SRA-BC(NS)	SRA-Base Case (Near Simultaneous-East)	DCSOPS
STAB UP	Update of the STAB QRA	DCSOPS
SWA-RA	Southwest Asia Risk Analysis	ARCENT
SWA-RA II	Southwest Asia Risk Analysis II	DCSOPS

TALPANAL	Total Army Language Program Analysis	DCSINT
TERPS	The Environment Resources Programing Study	ACSIM
TRAIN REQ	TRAINLOAD Requirements Update	DCSOPS
TRAINLOAD	Training Load on Active Duty Installations	DCSOPS
TU-93	Tactical Wheeled Vehicle Modernization Update - 93	DCSOPS
VAA: VAST	Value Added Support for TRADOC	TRADOC
VAAJAPA	Value Added Analysis: Javelin and Predator Analysis	ASARDA
WARREQ-NSC	WARREQ-01 No SADARM	DCSOPS
WRSA	War Reserve Stocks for Allies	EUSA

FY94 OTHER PUBLICATIONS

STS DOC	Spreadsheet Trans-shipment Simulation Documentation	CAA
USOB	US Order of Battle Update	CAA
CEMWES	Requirements for running CEM at WES	CAA
DATA DISK	A catalog of Attrition & Casualty Data Base on Diskette	DUSA(OR)
MANHATTAN	MANHATTAN Project Report	CAA
SPOP	Study Process Overview Pamphlet	CAA

FY93 STUDIES & CONTRACTS

ACRONYM	TITLE	SPONSOR
AFPDA 95/2001	Army Force Planning Data & Assumption - FY 95/2001	DCSOPS
AORNFS	Army Operational Requirements for Nuclear Fire Support	DCSOPS
ARCAS	ARDENNES Campaign Simulation	CAA
ARM	Active/Reserve Mix Study	DCSOPS
ARMIN-DA	Army Initiatives-Deployment Analysis	DCSOPS
ARSTAR-92	Army Strategic Force Architecture - 92	DCSOPS
BAMS	Biological Assessment and Modeling Study	DCSOPS
CHEMDET	Chemical Deterrence Study	DCSOPS
DRAGON-ANVIL	USAREUR Political-Military Cell Preparation	USAREUR
EAD-CAS-MET	Echelon Above Division Casualty Estimation Methodology	DCSPER
EAHAP	Economic Analysis of HQDA Automation Program Study	SEC ARMY
EASTWIND 93	Political Environments Sensitivity Pol-Mil Game	USARPAC
EFES	Expanded Force Employment Study	DCSOPS
EMA	Evaluation of the MDEP Architecture Study	PAE
ETAJUP	Equitableness of Treatment in Army Judicial Procedings	DCSPER
J-CHEMRATES	Joint ServiceChemical Equipment Consumption Rates Defense	DCSLOG
JKACS	Joint US-ROK Arms Control Study, Game I	EUSA
KPOL	Korean POL Distribution Analysis	EUSA
LATAM 2001	Latin America Scenarios through 2001	DCSOPS
MADCAP-1	Combat Samples for Master Data Calibration Project-1995	ARCENT
MCOG I	Military Centers of Gravity Study - I	EUSA
NIA-1	Nuclear Impacts Analysis - 1	DCSOPS
PAR S&V	Personnel Attrition Rates in "Historical Land Combat Operations:" - Susceptibility & Vulnerability of Major Anatomical Regions	CAA
PAR-P1	Personnel Attrition Rates in Historical Land Combat Operations - Phase 1	CAA
RCTIFYRS	Reserve Component Training Installation Facility Yearly Requirements Study	DCSOPS
REEP	Renewables and Energy Efficiency Planning	COE
ROKMOD II	Republic of Korea Modernization II	EUSA
SRA-01	Support Requirements Analysis 2001	DCSOPS
STOCEM3	Stochastic Concepts Evaluation Model - Phase 3	CAA
TAA-01AE	Total Army Analysis - 2001 Alpha-East	DCSOPS
TACAAN	TACWAR Attrition Analysis	CENTCOM
UC RETRO	USAREUR Class V/VII Retrograde	USAREUR
VECCEM II	Structured Programming for Large Simulation II	DUSA-OR
WARREQ-95K	Wartime Requirements Analysis-Korea, FY 1995	DCSOPS
WARREQ-95M	Wartime Requirements Analysis-SWA, FY 1995	DCSOPS
WHITE RAIN 92	Chemical Weapons Deterrents Alternatives Strategies Wargame	DCSOPS

FY93 QUICK REACTION ANALYSES

ACAP 93	Army Support of Cooperation and Peacekeeping Workshop	DCSOPS
ALP	Assessment of Long-Term Peacekeeping	DCSOPS

ANFORSC	Assessment of NATO Force Success Criteria	DCSOPS
ANSG	Analytical Needs Study Group	USARSO
ARM-ACBOS	Active Reserve Mix-Assessment of Congressional Budget Office Force Options	ASAMRA
ARSTAR CA-2	ARSTAR Capabilities Analysis - 2	DCSOPS
ARSTAR CA-3	ARSTAR Capabilities Assessment	DCSOPS
ARSTAR CA-4	ARSTAR Capability Analysis-4	DCSOPS
ARSTAR CA-5	ARSTAR Capability Analysis - 5	DCSOPS
ASP-92	Army Strategic Force Planning Workshop 92	DCSOPS
BAT CAPER	Brilliant Anti-Tank Munition's Capability at Extended Range	DCSOPS
CHAPARRAL-93	CHAPARRAL 93 Law Enforcement Military Simulation	FORSCOM
CHEMDET II	Chemical Deterrence Survey	DCSOPS
CMASS SPT	Counterdrug Modeling & Simulation System Support	USARSO
CSA-CI	CSA Calendar Improvement	DACS
DA-ORH	Deployment Analysis, Operation Restore Hope	DACS
DIVCOST	Active-Reserve Division Costing	DCSOPS
EFSA	Engineer Factor Sensitivity Analysis	COE
FE 90-93	Force Employment 90-93	DACS
FSCM-BA	Force Structure Composition Model Branch Analyzer	DCSOPS
GEMS	GEMS For Analysis	DUSA-OR
GHQx -93	GHQx Issues Workshop	TRADOC
HEAT	Helicopter Effectiveness Analysis Task	DCSOPS
ICE-PAC3	Intercept & Chemical Effects-PATRIOT Advanced Capabilities3	DUSA-OR
JKACS-CEM-I	Joint US-ROK Arms Control Study-CEM-I	EUSA
JTAD-MAA	Joint Theater Air Defense-Mission Area Analysis	DCSOPS
LAMS	Louisiana Maneuver Support	TRADOC
LMI-QRA	Logistics Management Institute - QRA	OSD
LRPMW	Long-Range Planning Methodology Workshop	DCSOPS
MCOG II	Military Centers of Gravity Air Campaign	EUSA
MCOG IV	Military Centers of Gravity IV - Concept of Operations	EUSA
MCOG V	Military Centers of Gravity V - nK Intent	EUSA
MCOG VI & VII	Military Centers of Gravity VI&VII, Seasonal & TPFDD Variations	EUSA
MCOG VI-DA	Military Center of Gravity VI-Deployment Analysis	EUSA
MED-01 DNBI	Medical 2001-Rules and DNBI Rates	DASG
MEMU	Mine Expenditure Methodology Update	DCSOPS
MERLINS STAFF	MDEP Equation for Resource Linking System Supporting Trooplists	PAE
PAC3REVIEW	Patriot PAC-3 Missile Program Review	DUSA-OR
PALACE	Patriot Lethality and Chemical Effects	DCSOPS
PEKO	Peacekeeping Operations	DCSOPS
RAM CA-1	Roles and Missions Capabilities Analysis	DCSOPS
RAMEUR	Requirements Analysis for MRC-Europe Movement Requirements Analysis	DCSLOG
REESIN	Renewables and Energy Efficiency Sustainable Investment	ASA
ROKMOD 94-95	Republic of Korea Modernization 94-95	EUSA
ROKMOD LP	Republic of Korea Modernization Linear Programming	EUSA
S3C	Self Service Supply Centers	DCSLOG
SEMM	Support to Engineer and Mine Warfare Modernization Analysis	DCSOPS
SILENT	Survivability Issues Longbow Enhanced Tactics	DUSA-OR
SLS	Senior Leaders' Seminar	EUSA
STAB	Support to Total Army Basing Study	JCS
STRAT-MOD	Stratification Model of Theater Casualties	DCSPER
SUFRAS	Support Force Risk Assessment	DCSOPS
TAA-01AW	Total Army Analysis - 2001 Alpha-West	DCSOPS
TAB	The Army Briefing	DCSOPS
TAC	Tri-service Standoff Attack Missile ATACM Comparison	DCSOPS
TAC BAT	Tactical Air Contributions in the BAT Study	DCSOPS
TACOS	TAA-01A/COMRAD Similarity	DCSOPS
VAA: DICE	Value Added Analysis: Declining Investment in Coming Era	DCSOPS
VAA: GREYBEARDS	VAA: General Officer Rec Evaluations for Economic Analysis of Research & Development Stra	DCSOPS
VAA: MINI POM I	VAA: Mini Program Objective Memorandum - I	PAE

VAA: MINI POM II	VAA: Mini Program Objective Memorandum - II	PAE
WARREQ-01 DA	Wartime Requirements 2001 Deployment Analysis Support	DCSOPS
WARREQ-95E	Wartime Requirements Analysis-Europe, FY 1995	DCSOPS
WARREQ-95K	Wartime Requirements Analysis-Korea, FY 1995	DCSOPS
WARREQ-EURUP-99	Wartime Requirements Europe Updated - 99	DCSOPS

FY93 OTHER PUBLICATIONS

AOT-K	Anatomy of a Theater-Korea	CAA
CALAPER-92	Munitions Consumption Program Input-Output Guide	CAA
CAMP-REV1	Computer Assisted Match Progam User's Manual First Revision	CAA
CORBAN-UAV	Possible Modifications to the Corps Battle Analyzer Model	CAA
DOC TRANSMO	Documentation for TRANSMO Users and Analysts	CAA
GLOFAM-MI	Global Force Allocation Model-Methodology Improvement	CAA
KCAC 2000	Korean Campaign Analysis Comparison-2000	CAA
KORCAP	Korea Capstone	CAA
PK COS	COSAGE Probability of Kill Methodology Basic Data Requirements	CAA
UCUM	COSAGE User's Manual, Volumes I & II	CAA
TEAM ABRAMS	Test, Evaluation, and Modelling of ABRAMS	CAA

FY92 STUDIES AND CONTRACTS

AIMS 99-I	Army Integrated Mobilization Study-99, Phase I	DCSOPS
ARC	Analysis of Army Reserve Component Clothing Replacement Process	DCSLOG
ARSTAR	Army Strategic Force Architecture	DCSOPS
ASOS	Army Support Options Study	ASAMRA
BE-91	BEAU GESTE - 1991 Political-Military Game	DCSOPS
C2A2	Command & Control AcquisitionAlternative Study	DCSOPS
CARG-O	Conventional Arms Reduction Game - Optimized	CAA
CASMO-VAL	Combat Analysis Sustainability Model Verification and Validation	OPTEC
COMRAD	Component Requirements & Authorization Determination	ASAMRA
CTLS-91	Concurrent Theater Level Simulation	DUSA-OR
CURE	Chemical Unit Requirements	DCSOPS
E-CEP	Enhanced Casualty Estimation Planning	DCSPER
HIGHWIRE 92	Nuclear Weapons Political IssuesPolitical-Military Game	DCSOPS
IAMS II	Integrated Army Mobilization Study-Phase II	DCSOPS/ DCSLOG
INFSCAP	Interservice Nuclear Fire Support Capabilities	DCSOPS
KOPLAN-91	Korean Operation Plan-1991	EUSA
META	Application of Meta-Analysis	CAA
RCIF	Review of the Calculation of Ammunition, Petroleum,and Equipment Requirements (CALAPER) Input Factors	DCSOPS
ROK-EAD	Republic of Korea - Extended Air Defense	CAA
SKYFLASH 92	Nuclear Weapons Requirements Political-Military Game	DCSOPS
SMA	Strategic Mobility Alternatives	DCSOPS
STOCEM 2	Stochastic Concepts Evaluation Model-Phase II	CAA
TAC LINK	Tactical Combat Samples & Linkage to TACWAR	EUSA
TW-91	Concurrent Processing and Time Warp Development	DUSA-OR
VAA 94-99	Army Program Value Added Analysis 94-99 - Phase II	DCSOPS
VALOR	Value Added Linear Optimization of Resources	CAA
VECCEM	A Structured Approach to Large-Scale Battlefield PHASES I&II Simulation	DUSA-OR
WARREQ 99	Wartime Requirements, Fiscal Year 99	DCSOPS

FY92 QUICK REACTION ANALYSES

AAF	Army Availability Factor	USAFISA
ACFAA	Army College Fund Allocation Analysis	DCSPER
AIMS II-M	Army Integrated Mobilization Study II - Medical	DASG
AIR OPTIONS	Aircraft Resource Allocation Options	DCSLOG
ALADDIN 92	ALADDIN 92	CAA
ARSTAR CA-1	ARSTAR Capabilities Analysis-1	DCSOPS
ASFPW	Army Strategic Force Planning Workshop	DCSOPS
AUTOCORE	Analytic Support to the Field Test of the Automated Core Document (ACD) System	DCSPER
B-FASS	Base Force Analysis	VCSA
BASFORMA	Base Force Reductions and Modernization Alternatives	DACS

BIODEF	Biological Defense Analysis	DCSOPS
CALOG SOS	Comparison of Army Logistics Support to Other Services	DCSLOG
CCASM	Contingency Corps-Armored Systems Modernization	DCSOPS
CFCS	Combined Forces Command Sustainment Assessment	EUSA
CFCS II	Combined Forces Command Sustainability Phase II	EUSA
CFCS-UP	Combined Forces Command Sustainability-Update	EUSA
CHEMSTORM	Chemical Warhead Impact on Desert Storm	DCSOPS
CIA	Comanche Impact Analysis	DCSOPS
CONCOR-UMD	Contingency Corps Unit Movement Data	TRADOC
COSAA	Combat Samples for the Air Force Studies & Analyses Agency	DUSA-OR
COSMIC	Cost Model Input Calculations	PAE
DNBI 2001	Disease and Nonbattle Injury Rates-2001	DASG
DOK	Defense of Korea	VCSA
DS-SEAD	Desert Storm-Suppression of Enemy Air Defense	CAA
DTCTS-SWA	Deployment-TRADOC Common Teaching Scenario-Southwest Asia	TRADOC
EADIMP	Economic Analysis of the DCSOPS Information Management Program	DCSOPS
EVADED	Evaluation of Elected Voluntary Alternate DESCOM Discipline	DCSPER
FASTAEDP	Fast Total Army Equipment Distribution Program	DACS
FOSMODTOS-IN	Force Structure and Modernization Tradeoff Analysis - Inputs	DCSOPS
FRONTIER 92	Global Wargame FY 1992	DCSOPS
GETAR-99	Global Excursion of Transportation Allocation Rules, SRA-99	TRADOC
HDASSCS	Heavy Infantry Division Analysis ofSoldier Support System Cost Study	AMC
HELL vs. LONG	HELLFIRE versus LONGBOW	DCSOPS
IPAEMA	Investment Programs of the Army: Economic & Modernization Analysis	DCSOPS
IRAFORMS	Initial Requirements Analysis for MRC-W Scenario	DCSLOG
KNOTS	Knowledge of Time Slippage	DCSOPS
KOWAP	Korean War Plan	EUSA
KOWAP-MOB	Korean Warfighting Operations Plan-Mobility Assessment	EUSA
LC3	Light Contingency Corps Capability	DUSA-OR
LC4	Light Contingency Corps Capability Continued	DUSA-OR
LIDASSCS	Light Infantry Division Analysis of Soldier Support System Cost Study	AMC
MEDEVAC 2001	Medical Evacuation 2001	DASG
MP EXC 99	Military Police Excursion, TAA-99	DCSOPS
MRC-CASREP-97	Major Regional Contingency Casualty Replacement Requirements Report	DCSPER
MRSSWA-POMEX	Mobility Requirement Study-Southwest Asia, POMCUS Excursion	DCSOPS
MSS-TDB	Mobilization Stationing Study-Transportation Databases	ChOE
POMCAPE	POMCUSITE System Capability Expansion	USAREUR
POMCAPE SME	POMCUSITE Capability Expansion Siting Model Enhancement	USAREUR
POMEVAL 94-99	Evaluation of POM 94-99	PAE
RAM SLAM	Replacement Maintenance Using SLAM	EUSA
RAM SLAM 2	Replacement Maintenance Using SLAM - II	EUSA
RCSTAS	Reserve Component Stationing Study	DCSOPS
RETRO-EUR	Retrograde-Europe	DCSOPS
ROKMOD	ROK Modernization	EUSA
ROK-MODS	ROK Modernization Sustainability	EUSA
SAWVAS	Support Area Wheel Vehicle Vulnerability Assessment	EUSA
SCSC-M	Support to Conventional Systems Committee-Munitions	DCSOPS
ST BARBARA 91	Army Nuclear Fire Support Synergistic Game	DCSOPS
SWA 2000	Southwest Asia 2000	DCSOPS
TARO 91	Political-Military Game TARO 91	USARPAC
TD90	Tae Kwon Do, FY 90	EUSA
THAADS-SWA	Theater High Altitude Air Defense System-Southwest Asia	DCSOPS
TPUG	Tank Propulsion Upgrade	DACS
TRETOAD+	The Restructured European Theater of Operations Air Defense Plus	PAE
TS	Tank Sight	DCSOPS
TU-92	Tactical Wheeled Vehicle Modernization Update - 92	DCSOPS
UAV-ROH	Unmanned Aerial Vehicle to Replace Older Helicopters	PAE
VAA: AMAVRTL	VAA: Analysis of Modernization Alternatives at Various Research, Development, and Acquisition (RDA) Total Obligational Authority Levels	PAE

VAA: CSAOR	Value Added Analysis: Chief of Staff Army Offsite Review	DCSOPS
VAA: LAPS	Value Added Analysis: Long-Range Research, Development, and Acquisition Plan (LRRDAP) Analysis Planning Session	DCSOPS
VAA: LGORS	Value Added Analysis: Long-Range Research Development, and Acquisition Plan (LRRDAP) General Officer Review Support	DCSOPS
VAA: SAMQ	Value Added Analysis: Secretary of the Army Modernization Questions	SEC ARMY
VAA:EATSM	Value Added Analysis: Economic Analysis of Tradeoffs in Structure & Modernization	PAE
WW-CASREP-97	Worldwide Casualty ReplacementRequirements Report, FY97	PERSCOM
XDTRAP	Counterdrug Transportation Requirements Analysis Program	USARSO

FY92 OTHER PUBLICATIONS

ARBSIT	ATVAL Recommendations: Brigade Samples in Theater	CAA
ATVAL II	Attrition Calibration (ATCAL) Evaluation Phase II - Indirect Fire	CAA
ATCAL P2SIM	ATCAL Phase II, Simscript II.5	CAA
BAMC	Benchmark for Artillery Munitions Consumption	CAA
E-CALAPER	Enhancements to Calculation of Ammunition, Petroleum, and Equipment Rates Process Review	CAA
CAS-IMPACTS99	Impacts of Force Structure (FY99) Changes on Casualty Generation Report	CAA
CASPRO	Casualty Estimation Process Review	CAA
FSSS-MR	FASTALS Sensitivity with Small Scenario-Minor Rules	CAA
K-TBMD	Korea - Tactical Ballistic Missile Defense	CAA
VOLLEY FIRE	Foundations of the General Theory of Volley Fire	CAA

FY91 STUDIES AND CONTRACTS

A2D2P2	Anti-Armor Defense Data, Phase II	CAA
ARIM	Army Resource Integration and Management	DCSOPS
ATVAL	ATCAL Evaluation	CAA
CHEMPHASE	Chemical Protection Hazard Assessment in Europe Study	DCSOPS
CMA	Counter-drug: Mandate for the Army	DCSOPS
DSSLL	Desert Shield Strategic Lessons Learned	DCSOPS
DYNAFOR	Accessions Forecasting for Dynamic Force Structures	DCSPER
EMPDA	Enhanced Massively Parallel Deployment Analysis	DUSA-OR
ETRANS	European Transportation Requirements for Backhaul of Personnel/Cargo	DCSLOG
FES	Force Employment Study	DCSOPS
FASTAUTO	FASTALS Automation Contract	CAA
IMAM	Information Management Modernization Study	DISC4
IV&V FORCEM C2	IV&V FORCEM C2 Module	CAA
IV&V GDAS II	IV&V Global Deployment Analysis System, Phase II	CAA
IWAS-EC	Initial Wartime Army Support-Effectiveness & Capability	DCSLOG
LRAMRP	Long Range Army Materiel Requirements Plan Study	TRADOC
MARTEP	Maritime Terminal Evaluation Program	DCSLOG
NATO 2000V	NATO 2000 Appendix	DCSOPS
OMNIBUS-91F	Operational Readiness Study FY-91 (FORCEM)	DCSOPS
POMCUSITE	POMCUS Unit Siting Alternatives Study	USAREUR
PROBATIONS	Probabilistic Foundations for a Fully Stochastic Theater-Level Ground Combat Simulation	CAA
RACCK	Regional Assessment Combat Capability-Korea	EUSA
RACCK-CALAPER	Regional Assessment Combat Capability-Korea, Calculation of Ammo, Petroleum and Equipment	EUSA
RACCK-CHEM	Regional Assessment Combat Capability-Korea, Chemical Analysis	EUSA
RACCK-DA	Regional Assessment Combat Capability-Korea, Deployment Analysis	EUSA
RACCK-FASTALS	Regional Assessment Combat Capability-Korea-FASTALS	EUSA
SCALED II	Simple Combat Attrition Law Evaluation Data, Phase II	DUSA-OR
SOVA	Soviet Air Operation Analysis Study	DCSOPS
SRA-99	Support Force Requirements Analysis - 1999	DCSOPS
STRADER	Strategic Deployment Analysis Review	DCSLOG
TACNUC	Theater Analytic Nuclear Model	DCSOPS

TWVMU	Tactical Wheeled Vehicle Modernization Update	DCSOPS
VALUE ADDED	Value Added Analysis 90-97	PAE

FY91 QUICK REACTION ANALYSES

AAMU	Army Aviation Modernization Update	DCSOPS
AAMU-SR	Army Aviation Modernization Update-Scout Relook	DCSOPS
ALF-1	Airlift Force Study	VCSA
ARVIS-DA	Army Vision Deployment Analysis	DCSLOG
BA91	Political-Military Game BALBOA 91	USARSO
CADAVR	CORBAN Air Defense ArtilleryValidation & Review	PAE
CASIO	Chemical Attacks Against Contingency Staging Areas	DCSOPS
CMMS II-CO	Congressionally Mandated Mobility Study II-CINC Options	DCSLOG
CMMS-NATO	Congressionally Mandated Mobility Study, NATO	DCSOPS
CMMS-NEA	Congressionally Mandated Mobility Study, NEA	DCSOPS
CMMS-SWA	Congressionally Mandated MobilityStudy, SWA	DCSOPS
CMMS2-AMD	Congressionally Mandated Mobility Study 2, Army Mobility Data	DCSOPS
CORCFE	CORBAN Centralized Forces Europe	PAE
COSWA-AF-MEA	COSWA-Alternative Forces-Munition & Equipment Analysis	DCSOPS
COSWA-AIM	COSWA - Air Interdiction Maneuver	DCSOPS
COSWA-ALT	COSWA - Alternative Contingencies	DCSOPS
COSWA-DCAS	COSWA - Division Casualty Stratification Analysis	DCSPER
COSWA-RAN	COSWA - Requirements Analysis	DCSOPS
COSWA-RES	COSWA - Residual Force Requirements	DCSLOG
COSWA-SPT	COSWA - Supportability Analysis	DCSOPS
COSWA-STK	COSWA - Stockage	DCSOPS
COSWA-STK-MEA	COSWA - Stockage-Munitions & Equipment Analysis	DCSOPS
COSWA-SUM	COSWA - Summary	DCSOPS
COSWA-SUM-UP	COSWA - Summary Update	DCSOPS
COSWA-SUMFOR	COSWA - Summary FORSCOM	DCSOPS
COSWA-SUPAN	COSWA - Support Analysis	DCSOPS
COSWA-XAIR	COSWA - Extended Air Operations	DCSOPS
COVARA	Cost Variability Analysis	USASAC
CPOST	Post-CFE Posture Assessment	DCSOPS
CRISK	CFE Circumvention Risk Assessment	DCSOPS
DAIRICOWS	Detailed Analysis/Invest. of Resource Items & Costs of Weapon Systems	DCSOPS
DESERT RAMP	Desert Ramp (There is no summary for this)	DCSOPS
DSAD-FROG	Desert Shield Air Defense-Free Rocket Over Gound	DCSOPS
DSAD-PS	Desert Storm Air Defense Patriot Stockage	DCSOPS
DSAW-ATEMS	Desert Shield Air Warfare-ATACMS Employment	DCSOPS
DSAW-EAD	Desert Shield Air Warfare-Extended Air Defense Analysis	DCSOPS
DSAW-IUD	Desert Shield Air Warfare-Israeli Urban Defense	DCSOPS
DSCA I	Desert Storm - Campaign Analysis I	DCSOPS
DSCA II	Desert Storm - Campaign Analysis II	DCSOPS
DSCA III	Desert Storm - Campaign Analysis III	DCSOPS
DSCA IV	Desert Storm - Campaign Analysis IV	DCSOPS
DSCA V	Desert Storm - Campaign Analysis V	DCSOPS
DSLL	Desert Shield Lessons Learned	DCSOPS
ETRANS-FOS	European Transportation-Roundout Support	DCSLOG
FLOATPOM	Floating POMCUS Analysis	DCSLOG
FOD-FDAT	Forward Deployed Force Alternative	VCSA
FOMOSA	Force Modernization Sensitivity Analysis	DCSOPS
FORR-MAN	Force Regeneration/Reconstitution-Mobility Analysis	DCSOPS
GE-TAR	Global Excursion of Transportation Allocation Rule	TRADOC
HARMS	HIMAD Anti-Radiation Missile Survivability Analysis	DCSOPS
HO-91	Political-Military Game Horizon 91	EUSA
HOBOCOBA	Homeward Bound Cost-Benefit Analysis	DCSOPS
IFC-AMA	Improved Force Closure-Army Mobility Analysis	DCSOPS
IFCA-FAS	Improved Force Capability Support Analysis	DCSOPS
KOWAP-DA	Korean War Plans - Deployment Analysis	EUSA
MA91	MAGELLAN 91	DCSOPS
MARCFAC	MARC Availability Factors	USAFISA
MOD-U	Modernization Update, 1980-1990	DCSOPS
MPM-CAS	Medical Planning Module - Casualties	DCSOPS

MRC-E-C	Mobility Requirements-MajorRegionalConflict, East, Case C	DCSOPS	PS90-II	Political-Military Game PilSong 90-II	EUSA
			SDOP	Secretary of Defense Option	DCSOPS
MRC-EAST	Mobility Requirements Study-Major Regional Conflict, East, Case B	DCSOPS	SIGINT STORM	Vulnerability of SIGINT Vehicles Within the Context of Operation Desert Storm	ISC
MRC-WEST	Mobility Requirements Study-Major Regional Conflict, West, Case C	DCSOPS	STIR-FRI	Stinger Threat-based InventoryRequirement-Fsst Reaction Investigation	DCSOPS
MRSSWA-DEX	Mobility Requirement Study Southwest Asia, Case D	DCSLOG	TA91	Japan/Pacific TARO Political Military Game	USARPAC
NRISK-90	Non-Negotiated Reduction Risk Assessment 1990	DCSOPS	TAFES-II	Total Army Force Evolution Study II	DCSOPS
NSO	National Guard Structure Options	DCSOPS	TAFES II-MA	Total Army Force Evolution Study II-Mobility Analysis	DCSOPS
PERSYST	Civilian Personnel Classification System	DCSPER	VCSA-CLV	VCSA Controlled Munition Assessment	DCSOPS
PS90	Political-Military Game PilSong 90	EUSA			

APPENDIX A

CAA ANNUAL STUDY, WORK, EVALUATION, AND REPORTING SYSTEM (ANSWERS)

Category (Type)	Sponsor	Mode	Authority	Tasker	Approval Level		Analysis QA		Documentation		
					Sponsor	CAA	Sponsor	CAA	Product	QA	Approval
Study	External	In-house	AR 5-5 AR 10-88	Study Directive	*HQDA Staff Agency Head *MACOM Cdr	Director	GOSC SAG	ARB	*Usually Study Report *Exceptions - Dir approval	PRB	Dir, CAA
		Contract	AR 5-5 AR 5-14 AR10-88	*Management Decision Memorandum *RFP	*AMC *SIMTECH *DOD/DA		SAG IPR		(Note a)	COR	
Quick Reaction Anlaysis (QRA)	External	In-house	AR 10-88 (MOD)	CAA Fm 233	*HQDA Staff Agency Head *MACOM Cdr	Director Division Chief (Note c)	*HQDA Staff Agency Head *MACOM Cdr	ARB	Memorandum Report	TQM	Dir, CAA
Project	External	In-house	AR 10-88	Study Directive	*AMC *SIMTECH *DOD/DA or Dir, CAA (on behalf of sponsor)	Director Division Chief (Note c)	N/A	ARB	Technical Paper (Note a)	PRB COR	Dir, CAA
		Contract	AR 5-5 AR 5-14 AR10-88	*Management Decision Memorandum *RFP							
Research & Analysis Activity	Internal	In-house	AR 10-88	Directive	Dir, CAA	Dir >4 PSM Division Chief <=4 PSM	N/A	TQM ARB	(Note b) (Note a)	TQM Div Chief COR	Dir, CAA Div Chief Dir, CAA
		Contract	AR 5-5 AR 5-14 AR10-88	*Management Decision Memorandum *RFP							
CAA Management Mission Support	Internal	In-house	AR 10-88	CAA Fm 233	Div Chief	Div Chief	Div Chief	Div Chief	(Note b)	Div Chief	Div Chief

a Documentation for contracts will be as specified by RFP. May be amended by negotiation between CAA and the contractor
b Type product is determined by specified CAA approval authority
c Division Chiefs have interim authority for QRA and Projects

APPENDIX B

DEFINITIONS OF CAA WORK CATEGORIES

This appendix contains short descriptions of CAA's principal work categories.

Study - A major in-house or contract effort which is externally sponsored by a HQDA or DOD staff element, MACOM, or other government agency. The analysis effort generally involves more than one-half of a professional staff year (PSY) and the duration usually exceeds 90 days (reference AR 5-5, AR 5-14, AR 10-88). A study directive is required for all in-house CAA study efforts (DA Pam 5-5). CAA documents the results of studies with a Study Report.

Quick Reaction Analysis (QRA) - An operational or strategy oriented analysis of a pressing issue(s) conducted on a quick response basis. QRA are externally sponsored and performed in-house. The analysis effort is less than one-half a PSY and the duration is normally less than 6 months and frequently less than 30 days. CAA documents results of QRAs with a Memorandum Report.

Project - An in-house or contract analytical support effort undertaken by CAA on behalf of an external sponsor. Projects include CAA analytical support activities such as model validation and verification, peer reviews of studies, and international analytic exchange programs. Projects can range from relatively low-cost, short-term efforts to major efforts equivalent in scope to a study. CAA generally documents results of projects with a Technical Paper.

Research and Analysis Activity (RAA) - A CAA-sponsored, in-house effort aimed at developing or improving analytical systems or techniques. Includes the development and modification of analytical models and data bases to support the conduct of studies, QRA, and projects. The product is determined by the tasking authority.

CAA Management/Mission Support (MMS) - Selected work efforts supporting internal CAA program management. The product is determined by the tasking authority.

GLOSSARY

Acronym	Definition
ACSIM	Assistant Chief of Staff for Installation Management
ADA	Air Defense Artillery
AHPCRC	Army High Performance Computing Research Center
AMSAA	Army Materiel Systems Analysis Agency
APAB-PI	Active, Passive, Attack, BMC41 - Pillar Integration
APC	Armored Personnel Carrier
ARCAS	Ardennes Campaign Simulation
ARCENT	US Army Central Command
ARES	Advanced Regional Exploratory System
ARPO	Advanced Research Project Office
ASA	Assistant Secretary of the Army
ASAILE	Assistant Secretary of the Army for Installations Logistics and Environment
ATCAL	Attrition Calibration
AUSA	Association of the US Army
AWC	Army War College
BRAC	Base Realignment and Closure Commission
BWC	Biological Warfare Convention
C4ISR	Command, Control, Communications, Computers, Information Systems Reconnaissance
CALAPER	Calculation of Ammunition, Petroleum & Equipment Rates Model
CASCOM	Combined Army Support Command
CDMS	COSAGE Data Management System
CEM	Concepts Evaluation Model
CENTCOM	U.S. Central Command
CFC	Combined Forces Command
CHD	Conservative Heavy Division
CHPPM	US Army Center for Health Promotion and Preventive Medicine
CINC	Commander-in-Chief
CINCC	Commanders-in-Chief of the Combatant Commands
COEA	Cost and Operational Effectiveness Analysis
CONOPS	Concepts of Operations
CONUS	Continental US
CORBAN	Corps Battle Analyzer
COSAGE	Combat Sample Generator
CS/CSS	Combat Service/Combat Service Support
CW	Chemical Warfare
CWC	Chemical Warfare Convention
DA	Department of the Army
DACS	Chief of Staff of the Army
DAMO-FDX	DCSOPS - Force Development Division
DAMO-SSW	DCSOPS - War Plans Division
DAST	Deployable Analytical Support Team
DAWMS	Deep Attack/Weapons Mix Study
DCSOPS	Deputy Chief of Staff for Operations and Plans
DEA	Data Exchange Annex
DNBI	Disease & Non-battle Injury
DPAE	Director, Program Analysis & Evaluation
DPG	Defense Planning Guidance
DPG-IS	Defense Planning Guidance - Illustrative Scenario
DSM	Decision Support Model
DUSA(OR)	Deputy Under Secretary of the Army (Operations Research)
EAD	Echelons Above Division
EAGLE	A CAA Corp-level model
EFOR	European-Only Force
EPA	Environmental Protection Agency
EPW	Enemy Prisoner of War
EUSA	Eight US Army (Korea)
FASTALS	Force Analysis Simulation of Theater Administrative and Logistics Support
FD	Force Development
FEBA	Forward Edge of the Battle Area
FORSCOM	Forces Command
FXXI	Force 21
FY	Fiscal Year
GAO	General Accounting Office
GDAS	Global Deployment Analysis System
GUI	Graphical User Interface
HN	Host Nation
HQDA	Headquarters Department of the Army
IDA	Institute for Defense Analysis
IPS	Illustrative Planning Scenario
ISB	Intermediate Staging Base
J8	Strategic Plans & Policy
J5	Force Structure Resources & Assessments
JANUS	A TRADOC model
JCS	Joint Chiefs of Staff
JICM	Joint Integrated Campaign Model
JOPES	Joint Operations Planning and Execution System
JTMD	Joint Theater Missile Defense
JWARS	Joint Warfighting System
JWCA	Joint Warfare Capabilities Assessment Group
KCMIA	Killed, captured, missing in action
KIDA	Korean Institute for Defense Analysis
KOSAVE	Kursk Operation Simulation and Validation Exercise
LAN	Local Area Network
LDR	Land Disposal Restriction
LIN	Line Number
LPXMED	External Logistics Processor, Medical Module
MACOM	Major Command
MERLIN	MDEP Equation for Resource Linking
MISMA	Model Improvement Study Management Agency

Acronym	Definition
MOBCEM	Mobilization Capabilities Evaluation Model
MORS	Military Operations Research Society
MR	Memorandum Report
MRC	Major Regional Contingency
MTMC	Military Traffic Management Command
MTOF	Mission Task Organized Forces
MTW	Major Theater War
NATO	North Atlantic Treaty Organization
NBC	Nuclear Biological & Chemical
NEA	Northeast Asia
NG	National Guard
nK	North Korea
NLT	Not Later Than
NMS	National Military Strategy
NS-MRC	Near simultaneous - Major Regional Conflict
OCONUS	Outside the continental US
OCS-AIG	Office of the Chief of Staff - Army Inspector General
ODCSINT	Office of the Deputy Chief of Staff for Intelligence
ODCSLOG	Office of the Deputy Chief of Staff for Logistics
ODCSOPS	Office of the Deputy Chief of Staff for Operations & Plans
ODCSPER	Office of the Deputy Chief of Staff for Personnel
ODP	Officer Distribution Plan
OFOR	Over-the-horizon
OFP	Objective Force Planning
OOTW	Operations Other Than War
OPLAN	Operational Plan
OPORD	Operations Order
OPTEMPO	Operating Tempo
OSD	Office of the Secretary of Defense
PA&E	Program Analysis & Evaluation
PAPA	Pollution Abatement and Prevention Analysis
PC	Personal Computer
PERSEUS	Planning Environmental Resource Strategy Evolution & Utility Study
PFP	Partnership for Peace
PIP	Product improvement plan
POC	Point of Contact
POL	Petroleum, Oils, Lubricants
POM	Program Objective Memorandum
POMCUS	Prepositioned Materiel Configured to Unit Sets
PPBES	Planning, Programming, Budgeting, and Execution System
PPO	Pollution prevention opportunity
PSM	Professional Staff Month
QDR	Quadrennial Defense Review
QRA	Quick Reaction Analysis
R&D	Research and Development
RAA	Research and Analysis Activity
RALPH	Reduction to the ATCAL (Attrition Coefficient Phase I model
RCTIFYRS	Reserve Component Training Installation Facility Yearly Requirements Study
RDA	Research, Development, and Acquisition
ROE	Rules of Engagement
ROK	Republic of Korea
ROK MND	Republic of Korea Ministry of Defense
ROKA	Republic of Korea Army
ROKUS	Republic of Korea & US
RSB	Rear Staging Base
SAEDA	Subversion and Espionage Directed against the US Army
SAMAS	Structure and Manpower Authorization System
SARDA	Secretary of the Army for Research, Development & Acquisition
SCI	Sensitive Compartmented Information
SEC ARMY	Office of the Secretary of the Army
SFOR	Stabilization Force
SIMTECH	Simulation Technology
SRA-05	Support Force Requirements Analysis 2005
SSC	Smaller Scale Contingencies
STELA	A dynamic modeling software package
STOCEM	Stochastic Concepts Evaluation Model
SWA	Southwest Asia
TAA	Total Army Analysis
TACWAR	Tactical Warfare model
TAEDP	Total Army equipment distribution program
TF EAGLE	Task Force EAGLE
TFOR	Transition Force
THUNDER	An Airforce model
TOE	Table of Organization & Equipment
TPFDD	Time Phased Force Deployment Data
TRAC	TRADOC Analysis Center
TRADOC	Training and Doctrine Command
TRANSMO	Transportation Model
UJTL	Universal Joint Task List
USAREUR	US Army Europe
USARPAC	US Army Pacific Command
USEUCOM	US European Command
USFK	US Forces Korea
V&V	Verification & Validation
VRI	Vector Research Institute
WARREQ	Wartime Requirements
WIA	Wounded in action
WMD	Weapons of Mass Destruction
WORRM	Weapons Optimization Resources Requirements model
ZFOR	Military Observers Only